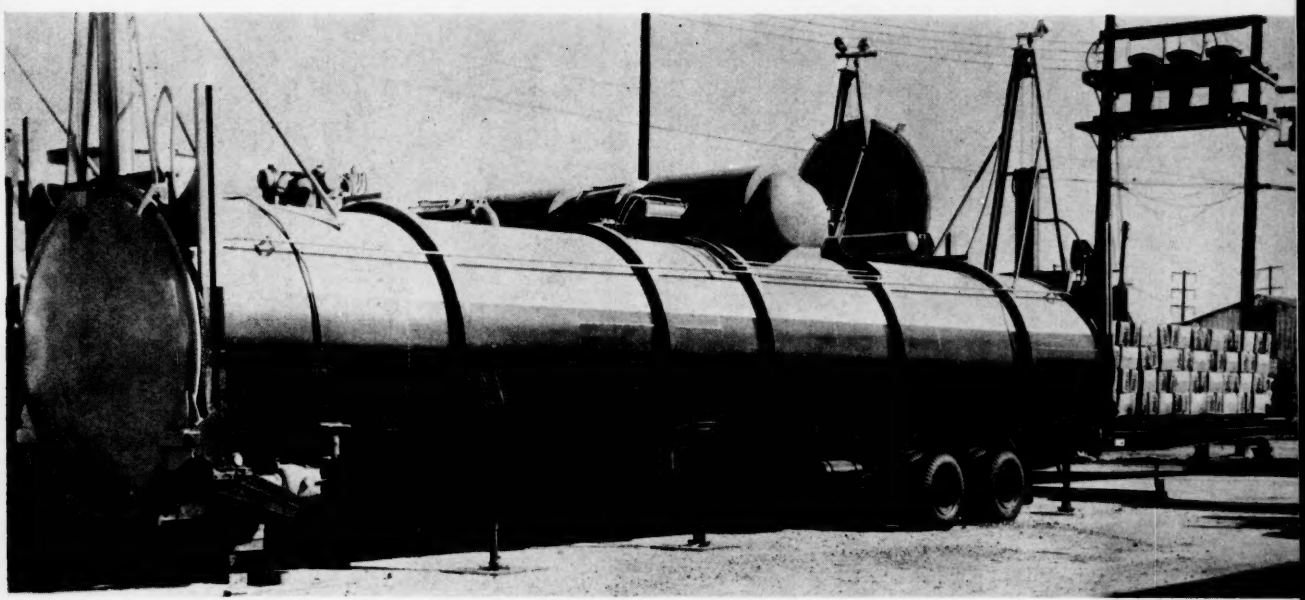
INDUSTRIAL REFRIGERATION

JULY 1959

Vol. 137 No. 1

Six Trailer Mobile Vacuum Cooling Plant Goes To The Product In The Field



Above—Portable Vacuum Processing Tube For Cooling Vegetable Produce. Mounted On A Special Trailer With Tandem Arranged Wheels, This Unit Is Moved From Job To Job In The Field By Means Of A Tractor Truck. On Location Jacks Relieve Tires And Level Up The Unit For Pallet Loading of Produce.

Right—E. A. Bivins Checks Instrumentation And Control Set-up For The Two Big Mobile Vacuum Tubes Used By Imperial Cooling Co., El Centro, California, Processor.

The Magazine Of Industrial Refrigeration And Industrial Air Conditioning

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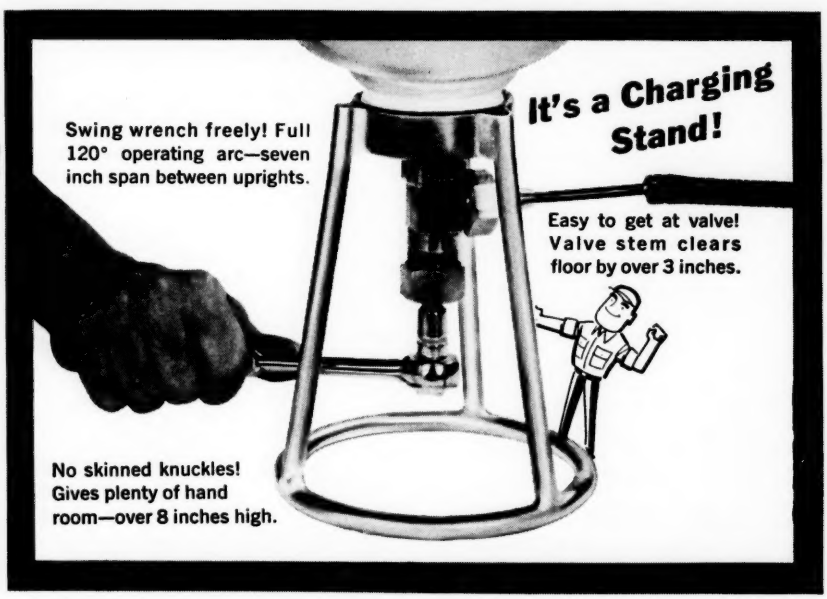
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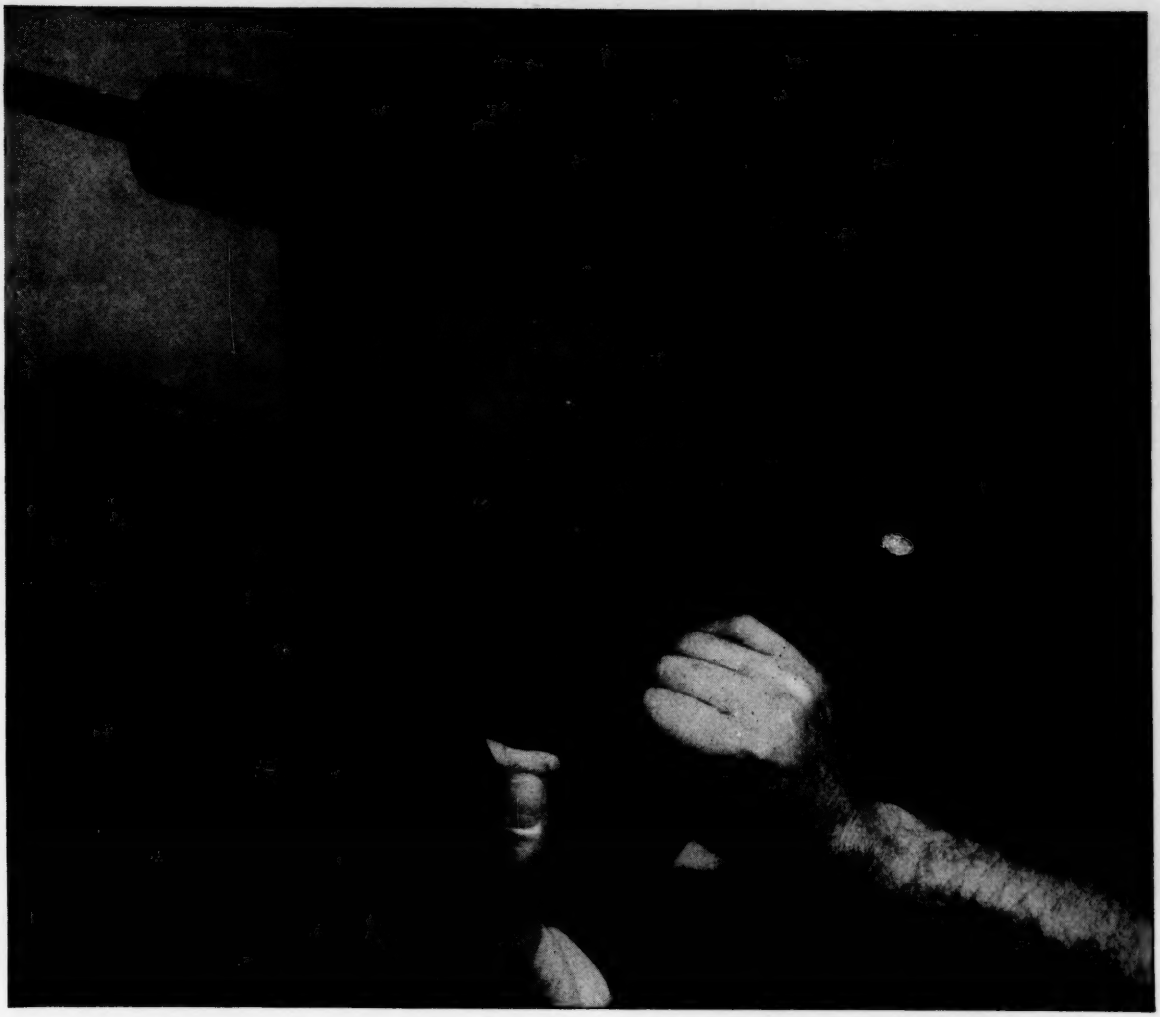

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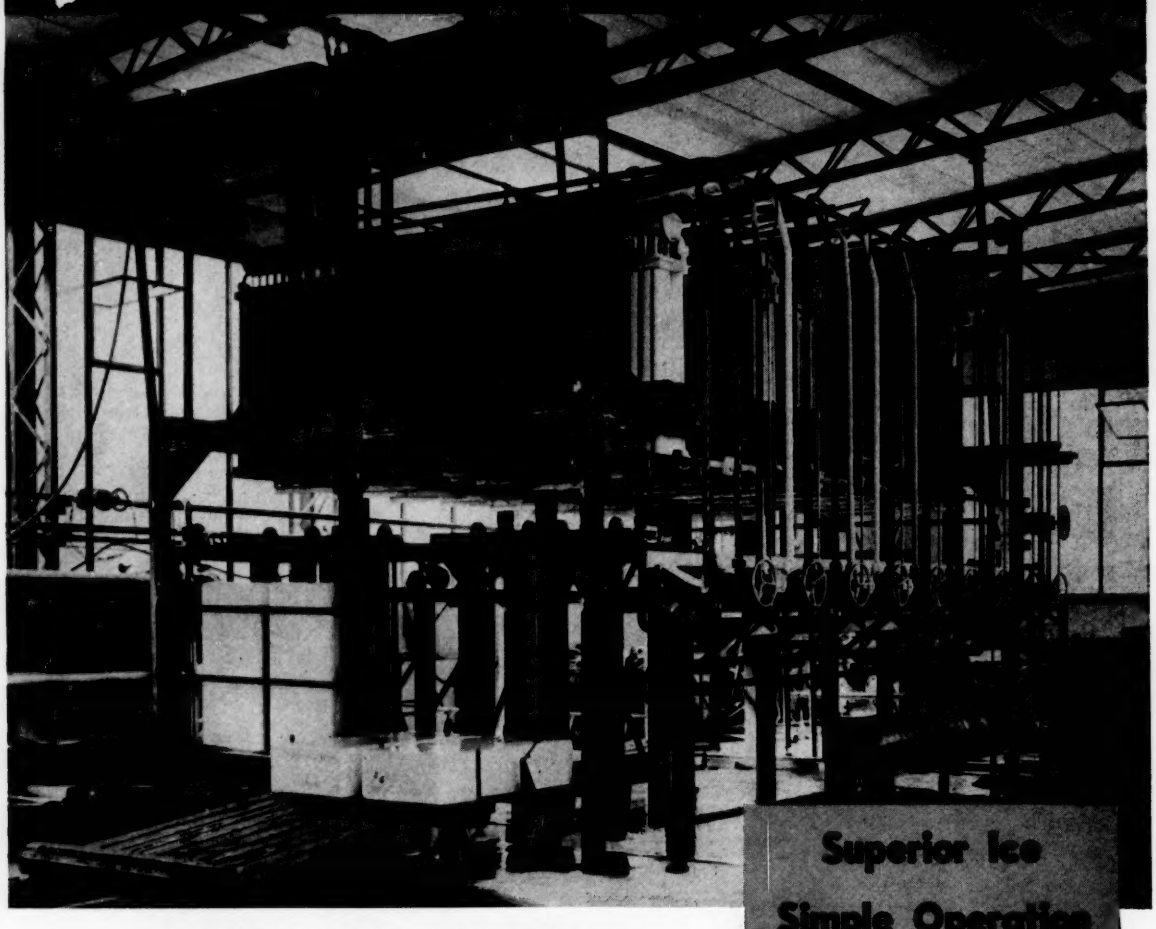

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July, 1959

Number 1

Vol. 137

Industrial Refrigeration

Now in its 68th Year of Publication

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Official Organ
National Association Practical Refrigerating Engineers

INDUSTRIAL REFRIGERATION, Vol. 137, No. 1, Published monthly at 433 N. Waller Ave., Chicago, Ill., U.S.A., by Nickerson & Collins Co. Yearly subscription in the U.S., $2.00 per year; other countries, $3.00. Single copies, 25 cents. Copyright 1959 by Nickerson & Collins Co. Acceptance as controlled circulation publication at Chicago, Ill., and Pontiac, Ill.

CHANGE OF ADDRESS—Notify publisher and your local post office promptly of change of mailing address to avoid non-receipt of copies. Copies incorrectly addressed, because of failure to notify publisher, cannot be replaced. Upon request, post office will provide, without cost, convenient "change of address" mailing cards.

Industrial Refrigeration is indexed regularly by Engineering Index, Inc., and is microfilmed for library use by University Microfilms.

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European Refrigeration Progress Reviewed 31
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COVER:
Operational Views Of Portable Vacuum Cooler Plant

CONTINUOUS vacuum precooling process can be taken to the crop in the field by means of a 6-trailer, 3-man operated, twin-tube mobile plant. Pictured in the top photo is one tube which can accommodate one-half carload of merchandise. Close-up below shows E. A. Bivins, operator, checking his instruments which are mounted on the second tube. Boiler plant for vacuum pumps is mounted on the trailer at right.

Published Monthly by NICKERSON & COLLINS CO.
General Offices: 433 N. Waller Ave., Chicago 44, Ill. Teles.: AUstin 7-1303-04-05

news briefs of the month

FF Distributors Ask Congress To Amend Robinson-Patman Act

Appearing before the U. S. House Small Business Subcommittee No. 5 on June 25, Harry K. Schauffler, Executive Director, National Frozen Food Distributors Association, asked members of Congress to consider a proposed amendment to the Robinson-Patman Act which would, if enacted, require frozen food processors to sell prospective buyers in their respective trade functions, specifically, to sell wholesalers at a wholesale price, and retailers, regardless whether they were corporate chain stores, co-operatives or independent grocers, as retailers.

The NFFDA representative charged discriminatory direct deals, with the chain buyer as the manipulator. He alleged that three national chains control 37 percent of the frozen orange juice sold at retail, smaller chains controlling 43 percent and the independents only 20 perecnt. He presented similar examples in poultry and canned goods retailing. He also pointed out that baked goods sold in chain stores are now their own manufacture and stated that some of the larger chains are dealing directly with the farmer for their live stock.

Schauffler also stated that the chain buyer often employed unrefrigerated trucks for delivering frozen foods to their retail stores and made proper zero temperatures for store handling, a joke.

Defense Course Offered

Two more Staff College Courses in Industry Defense and Mobilization are offered at the OCDM National Operational Headquarters in Battle Creek, Michigan. One course will be conducted August 24 to 28; the second November 16 to 20, 1959. Open to all who have responsibilities for emergency and disaster control planning in industrial plants, institutions and other large buildings and facilities, a purpose of the course is to develop the ability of American industry to protect its employees and plants, preserve its corporate structure and to plan restoration measures which will insure continuity of production.

Manhattan Survey Shows Near Saturation Point For Air Conditioned Apartments

Hudik-Ross, Inc., Manhattan mechanical contractors, recently pointed out a remarkable acceptance of air conditioning as standard equipment in hotels and privately constructed residential buildings. The report shows 96 percent saturation and even the four percent exception showed that the buildings did provide special outlets for later installations.

According to Frank Hudik, president, it was the in-wall units that gave air conditioning its great impetus in apartment houses. However, substantial gains have been made in central cooling. Hudik stated the survey indicated a definite trend toward central systems by which he contends that complete air conditioning can only be accomplished.

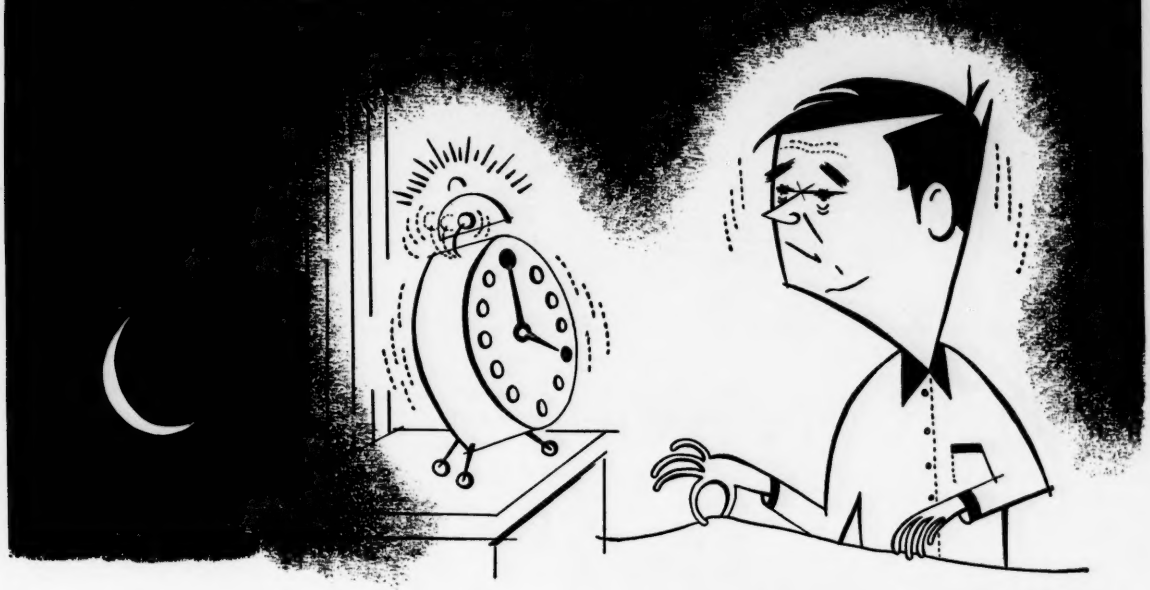
Truck-Trailer Mfgrs. Hold Summer Meeting

Interstate Commerce Commission Chairman, Kenneth H. Tuggle, is one feature speaker at the 11th Annual Summer Meeting of the Truck-Trailer Manufacturers Ass'n., July 12 to 15, The Homestead, Hot Springs, Virginia. Another feature is the traditional refrigeration round table which has scheduled a progress report on TTMA's Reefer Rating Program.

English Refrigeration For Soviet Plant

Under contract to supply large capacity refrigeration equipment for an unidentified plant in the USSR is an English firm, the FINANCIAL TIMES LONDON reported recently. The contract was reported at approximately $2,240,000. Power to drive the equipment is reported in excess of 25,000 hp. One English firm will manufacture the compressors, while a second will carry out the engineering and manufacturing of the electrical plant.

He Used to Get Up at 4 A.M. To Purge the Plant



. . . Before Installing an ARMSTRONG PURGER

Maybe this is an extreme case, but it's a true example of the inconvenience that is caused—in one way or another—by hand purging.

The engineer of a midwestern dairy used to get up at 4 A.M. whenever the refrigeration system needed purging, so that he could get the job done before starting up the plant for the day's work. He couldn't purge manually while the system was in operation without losing excessive amounts of refrigerant. Now, with an Armstrong purger, he can purge while the plant is in operation. And he devotes practically no time to the job—once he turns on the purger, it's completely automatic!

And he's cut operating costs, besides. The Armstrong purger takes *all* the air out of the system. Head pressures have been reduced 20 lbs., cutting power costs 10% and increasing capacity 5%. Less cooling water is consumed because the insulating blanket of air has been removed. And ammonia loss, once a costly item, has been cut to a negligible 2 lbs. per month.

The results in this case are not unusual, although the type of inconvenience may be. In case after case, Armstrong purgers have given similar benefits. So sure are the results, in fact, that you can now get one on a *30-day trial offer*. If you're not completely satisfied, your money will be refunded in full.

Why not find out more? Get the bulletin described at right—just use the handy coupon.

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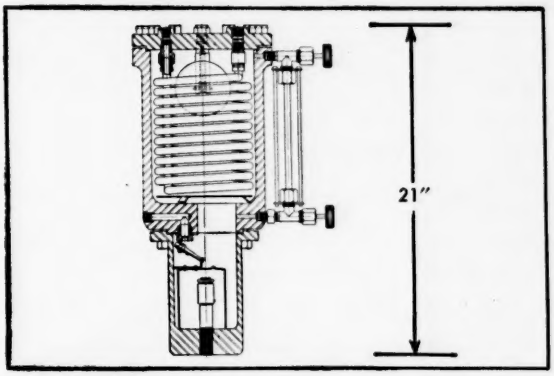

808-P

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Bulletin No. 2212 tells more about the benefits of efficient purging; gives physical data, price, and explanation of operation of Armstrong No. 370 Purger.

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What's New

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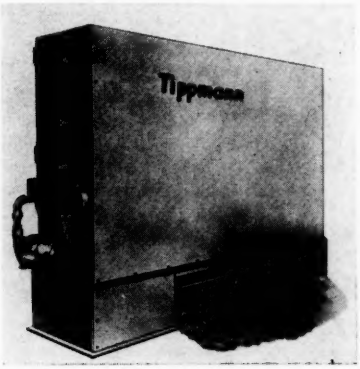
Peak Refrigeration Demands Start

New and Improved Equipment Help Offered

▶▶ INDUSTRIAL ICING and heavy comfort air conditioning both start their sharp rise toward peak loads in July. With the sharp increase of business or service, there generally arises considerable problems of additional capacity, inadequate machinery, condensing headaches, occasional dehumidifying problems, instrumentation needs, compressor motor protection and safety requirements, unforeseen. Fortunately, a number of manufacturers are aware of opportunities to introduce a new product which will help refrigeration users overcome the summer time inadequacies.

Plate Ice Maker Introduced

▶ BLOCK, shell, cube, tube, flake, and many other forms of ice have been introduced for a myriad of applications. Now consider the introduction of a line of ice making machines for producing custom sized ice described as *plate ice*.



Announced by a Ft. Wayne, Ind. firm, the machines were offered in single and multiple units with capacities of 1, 3, 5 and 10-tons each, per 24 hours.

The units are designed for use with ammonia or the halocarbons as refrigerant. The 1, 3 and 5 ton units using the fluorinated refrigerants may be either a remote or self-contained operation. The equipment offers optional accessories such as ice bins, ice vendors, and handling equipment.

The plate ice description is derived from the new ice making technique employed. Ice is produced on multiple plates which the manufacturer describes as being remarkably clear and easy to handle. An adjustable sizer is provided to produce ice of desired thickness.

Packaged Cooler Units For Vending Stations

▶ THOSE ICE VENDORS who have experienced refrigeration trouble already in the 1959 ice season, may appreciate a reminder from a Michigan firm that portable units similar to the popular window air conditioning unit, are now available for vending stations.

Recently announced, this new line of packaged cooler units is available in a variety of capacity cooling ranges and quick mounting types to meet every conceivable need for freezing, cooling and/or ice holding systems. They are completely self-contained, requiring no water or plumbing; just the electrical hook-up for power.

An outstanding feature is the speed and ease of installation on any equipment. On existing equipment, they report cost saving as replacement units. Once installed, without special tools, operation is completely automatic including defrosting. The manufacturer states that practical horsepower capacities are immediately available. Two such units are pictured below, left.

Rapid-Ice Equipment Now Available In US
(See Special Story, P. 22)

* * * *

High Efficiency Foam

▶ MENTIONED EARLIER in the year in this column was the fact that seldom a month goes by without the introduction of another new insulating material. Allied Chemicals, National Aniline Division recently introduced the use of *Genetron* 11 as a blowing agent which nearly doubles the thermal insulating efficiency of rigid urethane foams. Material costs, it is said, are substantially reduced. In addition to reducing heat loss to an all-time low, the *Genetron* supplied by Allied's General Chemical Corp. provides even flow and rise characteristics, permitting complete filling of larger and more complex voids.

New Evaporative Condensers

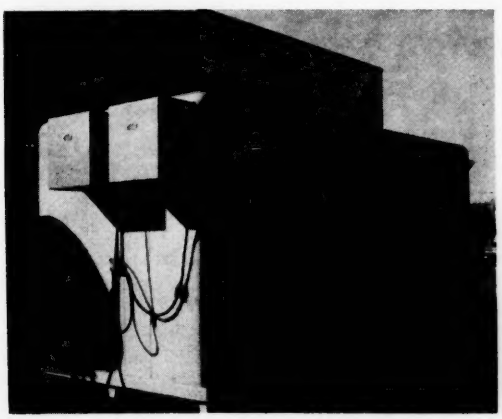
▶ KOHLENBERGER recently announced an expansion of condensing capacities from 10 to 300 tons in their KE-type evaporative condensers. Intended for either outdoor or indoor installations, these units are said to provide efficient operation and minimum floor space. Economical in water use, the fan members of these units are statically and dynamically balanced to minimize vibration, making them more readily adaptable for roof and indoor installations. This Fullerton, Calif. firm designs and manufactures a complete line of industrial refrigeration and air conditioning equipment.

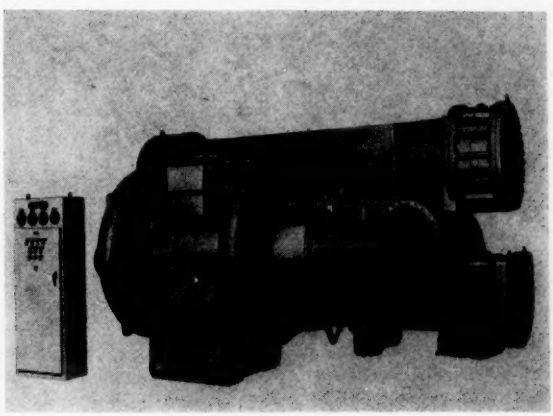
Intermediate A/C Capacity In Hermetic Centrifugals

▶ Operating capacity requiring 400 to 800-TR is now available in a new line of 2-stage *Tonrac* refrigeration machines. Designed specifically to provide chilled water for air conditioning of large buildings and factories, the units are also adaptable to heat pump applications.

The new machines are powered by water cooled hermetic motors available for operation with 208 to 6600-v current. Refrigerant 11 is employed.

(Continued on Page 38.)





International Refrigeration Congress

▶▶ APPROXIMATELY 330 papers are being contributed to the International Congress of Refrigeration which meets in Copenhagen August 19 to 26. Between 1500 and 2000 participants are expected.

The Nine Commissions will hold simultaneous meetings on the following topics: Low temperature physics and thermodynamics, with emphasis on very low temperatures and rare gases; Heat transfer, with consideration of thermal properties, materials, insulants and instrumentation; Design, construction and operation of refrigeration machinery; Food refrigeration; Cold storage warehousing and ice making plants; Industrial refrigeration applications other than food; Refrigerated transportation by land and air; Refrigerated transportation by sea; Education and training.

Following a general opening meeting at the Town Hall of Copenhagen, there will be three Plenary Meetings on the following general subjects: Human beings and the cold; Refrigerated transport of perishable foodstuffs; Developments and trends in refrigeration machinery. An exhibition of chilled and frozen foods from different countries and educational material is also slated. There will be continuous educational film shows.

Industrial Topics

Experiments over a period of several years in Denmark with the irradiation chilling of meat will be the subject of a discussion by Mr. Korsgard of the Sabroe Company, Arhus, and Mr. Larsen of the Norproduct Company, Copenhagen. The thought behind this method is that in effecting part of the chilling of carcasses by irradiation, chilling can be carried out in a room without air circulation thus reducing shrink.

Also on the refrigerated meat theme, there will be a discussion by Professor Gustav Lorentzen, Norway, regarding the possibility of freezing meat right from slaughter without prior chilling.

Thermoelectric cooling such as pictured on the cover of last month's INDUSTRIAL REFRIGERATION will be an interesting subject presented by Matts Backstrom of Sweden, Professor E. B. Penrod, U.S.A. and by V. S. Martinovsky and V. A. Nager, U.S.S.R. Dr. J. C. Fidler, U.K., will present a review of the latest methods for the control of superficial scald in apples during cooler storage.

Freeze drying, a topic much discussed at the April meetings of TRRF, will receive considerable interest at Copenhagen from USSR, USA, UK.

ASHRAE Meeting At Lake Placid

▶▶ FIRST annual meeting of the American Society of Heating, Refrigerating and Air Conditioning Engineers since the merger of the American Society of Heating and Ventilating Engineers with the American Society of Refrigerating Engineers early in the year, took place at Lake Placid Club, New York, June 22-24.

Technical sessions included presentation of formal papers on compressors, ventilation, noise, heat transfer, sound level, air conditioning, and two general sessions. Conferences subjects were, one each, on domestic refrigerators, industrial ventilation and cryogenics. In the compressor category W. G. Dorsey, Jr., Worthington Corp., presented Analysis of Turbine Driven Centrifugal Refrigeration Systems. R. J. McCrory, R. W. King and J. H. McNinch of Battelle Memorial Institute, delivered a paper on The Free Piston Compressor in an Air Conditioning System. F. J. Wiesner, Jr. and H. E. Caswell of Carrier Corp., presented a talk on Effects of Refrigerant Properties on Centrifugal Compressor Impeller Dimensions and Stage Performance.

General topics: Evaporative Cooling for Common Storages of Fruits and Vegetables by R. S. Ash, International Metal Products Co.; Controlled Atmosphere Apple Storage Process and its Requirements on Refrigeration Structures and Systems by J. W. Zahradnik, University of Massachusetts; Comparison of Fluoroalkane Absorption Refrigerants by B. J. Eiseman, Jr., E. I. duPont deNemours & Co.; Estimating Water Content of Certain Dried but Uncharged Hermetic Refrigerating Compressors by H. M. Elsey, J. B. Kelley and R. B. Sharpe, Westinghouse Electric Corp.; Viscosity of Refrigerants in the Vapor Phase, O. W. Witzell and C. Z. Kamien, Purdue University; Repeated Scrape Abrasion Testing of Enameled Wires in Gaseous and Liquid Refrigerants, F. F. Trunzo, G. J. Bich and G. W. Hewitt, Westinghouse.

The Cryogenics Conference dealt with the Closed Circuit Transportation of Cryogenic Fluids, V. J. Johnson, NBS, Cryogenics Engineering Laboratory, Chairman. Transfer of Cryogenic Fluids was discussed by Dr. R. B. Jacobs, CEL, NBS; Cryogenics Pump Design by L. Schafer, Borg-Warner Corp.; Cryogenics Insulation Materials and Techniques was presented by Dr. R. H. Krupschot also of NBS. Instrumentation Methods and Techniques for Monitoring and Controlling Closed Circuit Transportation of Cryogenic Fluids was given by Clarence Gettelman, Lewis Flight Propolsion Laboratory, NASA.

Solar Refrigeration Featured At N.Y.U.

▶▶ SYMPOSIUM of Solar Sciences, jointly sponsored by the New York University, the Association of Applied Solar Energy, and Stanford Research Institute of Palo Alto, featured a program on recent progress in solar refrigeration. The symposium was held at the New York University Club May 26, 27 and 28.

Erich Farber, University of Florida, made the report on solar refrigeration progress. He was followed by a panel which discussed photochemical and photoelectric conversion systems. It was evident in the discussions that many authorities believe the photochemical systems will be more efficient than thermal systems in putting the sun to work, especially in the refrigeration field. Moderator of the panel was Dr. Gerald L. Pearson, Bell Telephone Laboratories.

Presiding over the meeting was Harold K. Work, director, NYU Research Division. A featured speaker was Dr. Farrington Daniels, retired from the University of Wisconsin, a chemist of international reputation in kinetics, nitrogen fixation, atomic and solar energy. Jan Oostermeyer, retired president of Shell Chemical Company is president of the Association of Applied Solar Energy.

Co-chairmen of the Symposium were Dr. John Duffie, Univ. of Wis. and Dr. John P. Nielsen, NYU. Two distinguished foreign scientists participating were Dr. Harry Tabor of Israel and Dr. Rogen N. Morse of Australia. Dr. Tabor was moderator of a panel discussion on solar collectors. At present he is constructing the world's first power station to be run on solar energy, at Beersheba, Israel.

Dr. Morse participated in a discussion on water heating, space heating and cooling by solar means. That panel was headed by Dr. Hoyt C. Hottel, MIT, which recently completed the fourth solar house. Other participants in this symposium were George O. G. Lof, Denver, Colorado, a solar engineer, David Jenkins, chief, Saline Water Office, USDI, Peter E. Glaser, Arthur D. Little, Inc., and Dr. M. Telkes, Curtiss-Wright Corp.

Refrigeration For Quality Sausages

Usinger's To Celebrate 80 Years Completing Expansion, Remodeling

By RICHARD FRANCIS

▶▶▶NEXT YEAR, Fred Usinger, Inc., Milwaukee, Wisconsin, will celebrate its 80th anniversary. Since 1880, one generation of this family following another has produced quality sausage for the same discriminating tastes that make Milwaukee famous for its beer, cheeses, meat and dairy products.

Quality being the prime objective, the Usinger establishment has never overlooked an opportunity to modernize process and control equipment. At present, the firm is completing a third step in a post World War II modernizing program. Central refrigeration, with modern non-shrink evaporative surface in storage spaces has been as much a modernizing consideration as new sausage making machinery and a new steam plant.

Employees Encouraged In Self-Improvement Interests

Essential to fine tasting products is an understanding and interest on the part of all employees, with particular emphasis on the contribution each makes to the final product. Pride of participating in the making of high quality products is not only desirable, but the Usingers, Frederick D., Fred, Jr., and Carl Usinger, encourage their associates to continue personal self improvement.

For example, the engineers participate in several practical educational groups. Carl Usinger is an officer of one local chapter. Engineer Paul Henning, Jr. is Secretary, Milwaukee Chapter, NAPRE. Engineer Roy E. Fleischmann is Conductor, Wisconsin Chapter No. 18, NAPRE.

Founder of Fred Usinger, Inc. was Fred Usinger of Wiesbaden, Germany. Usinger migrated to the United States in the latter 1870's. The story is told that his pockets were stuffed with fine old sausage making formulae which he had learned in Frankfurt. In Milwaukee he found work in his chosen trade. A few years later he established his own sausage business in a shop on Third St., site of the present sausage factory.

Family Enterprise

The Usinger family tradition still dominates the modern mechanized gleaming tile and stainless steel, government inspected plant which evolved over 75 years. Choice cuts of meats and spices from all the world go into products that are cooked, smoked and refrigerated with the latest and finest.

In the early days, family living quarters were above the sausage shop. Workers lived in the dormitories to the rear. Today, the cork tile floored, fluorescent illuminated offices with modern invoicing and accounting equipment are still located over the retail shop and the shipping room, which faces Third St. The dormitories have disappeared, making way for expansion of the firm over the years. Today, a modern re-enforced concrete and masonry construction extends from Third Street to the Milwaukee River where sailing ships docked in the 1880's.

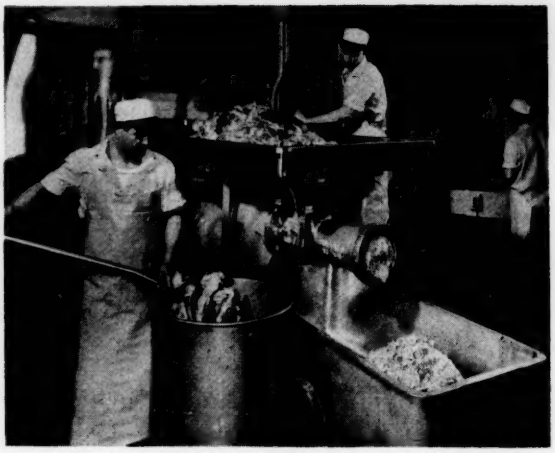
Over 100 Milwaukeeans are employed by Fred Usinger, Inc. One-fourth of these employees have been with the firm over 20 years. Executives are Frederick D. Usinger, President, the grandson of the founder. Fred Usinger, Jr. is Treasurer and Carl Usinger is the Chief Engineer

Cont'd on P'g 12; Photos, Pgs 10, 11 ▶

Fred Usinger, founder of the Milwaukee firm which carries his name, came from Wiesbaden, Germany and founded the sausage making organization.

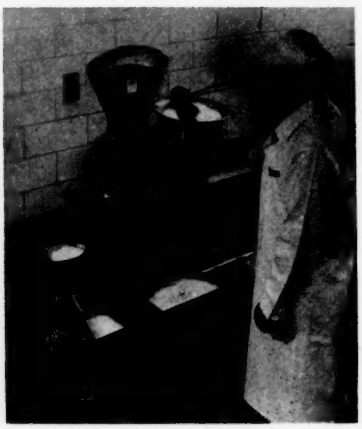
Retail store located on Third St. enjoys an exceptionally fine patronage. Old-World decor has not been altered or changed in the modernization program. Murals of elves around the room, and window displays of the little men, depict the various sausage making operations of this firm founded in 1880.

Fred Usinger's buyer purchases choice cuts direct from federally inspected meat packers in the Mid-West area. Cuts are placed in stainless steel containers and stored in receiving coolers located on the first-floor level.



Sausage makers feeding pork cuts into the grinder for one variety of product. Stainless steel and tile trim is typical throughout the establishment even in this older kitchen soon to be remodeled in expansion program.

Cutting room located at basement level in rear will be enlarged.



Fine spices are measured carefully before adding to old world formulas.

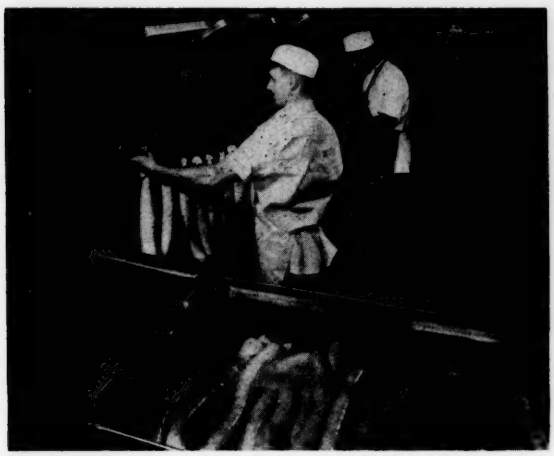
Meat, spices, and other ingredients are custom mixed for special varieties.

Above the trimming room, at the first floor level, is the sausage kitchen. Grinding and cutting operations are at the left, mixing and blending at left center, and stuffing operations at the right. Plans provide for doubling these facilities which, like the trimming area, will extend laterally thru the building. Stuffing operations will occupy this entire area, the grinder, cutter, etc. to be relocated.

Probably the most expensive item of machinery in the entire sausage factory is this high speed silent cutter, which cuts fresh meat into a very fine emulsion. Cutting speeds are sufficiently high to require shaved ice or chilled water for cooling. Ice, now purchased, will be provided for this and a second silent cutter by a Vilter ice-maker to be hooked up with the plant NH_3 refrigeration system.

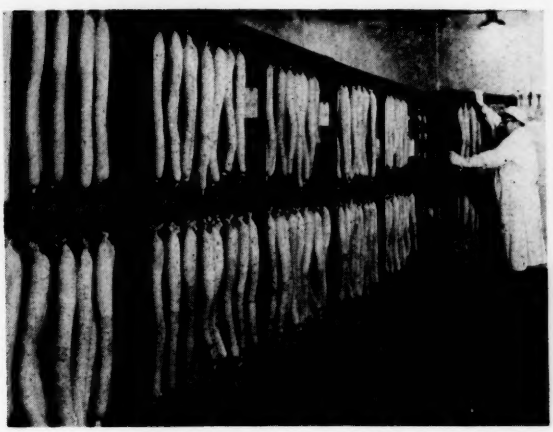
Stuffing sausage casings takes place on stainless steel tables in another corner of the kitchen. Basement refrigerated storages hold many hogsheads of prepared casings ready for use.

Wiener processing takes a slightly different production path than other sausage manufacturing. After meat ingredients are cut, they remain overnight at 42 F. Stuffing and smoking follows, to develop color, flavor, impart aroma.



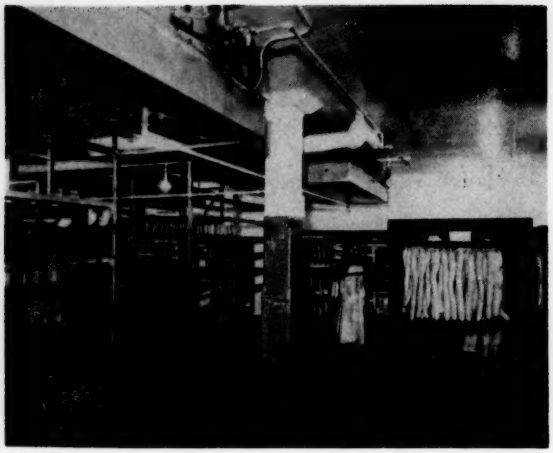
Braunsweiger liver sausage is loaded into stainless steel tanks for closely controlled cooking with steam agitation. Some sausages are cooked before smoking as shown, while others are steam cooked after smoking.

After smoking, wieners move to a steam cabinet for cooking. Cabinet at Usingers is a development of their own engineering department. Wieners are then cooled and labeled.



Cooked sausages are inspected, labeled and tiered in movable racks, then placed in coolers where they are held for specified lengths of time at closely controlled humidity and temperature.

After labeling, wieners are moved to refrigerated packaging rooms, then to a holding cooler, and from there to shipping room. The packaging room, refrigerated, holds many varieties it is noted besides the wiener.



Close tolerance over relative humidity achieves minimum shrinkage in all coolers; evaporator coils developed by Gebhardt are being used exclusively in the modernizing program.—*Photo Courtesy of Advanced Engr'g Corp.*

Shipping and packing room at Fred Usinger's are among the newest additions. Held below air conditioning temperatures, this is the make-up room from which orders proceed to the loading area.

of the firm. Mrs. Lena Usinger Calzavara is Vice President. Mrs. Ella A. Onsager, with 40 years of service is Secretary and Assistant Treasurer, and Wilbur E. Holtz is Controller. Frank Dopierala is "Wurstmacher" and Plant Manager.

Expansion Program and Process Material Handling

Expansion of the firm's facilities is a three step plan, two phases of which have been accomplished for all practical purposes. Property adjacent to the factory on the north side was acquired earlier. Two buildings immediately adjacent were incorporated into the present structure. A new boiler room was constructed in the rear on the northeast corner adjacent to the river front.

Razing and reconstruction activities provided a ramp along the north side of the building to accommodate larger refrigerated delivery trucks which bring in fresh meat and other ingredients. Their arrival and receiving at the rear does not interfere with Usingers own trucks or customer pick up at the Third St. end of the drive. Receiving is done at the north side rear, river dock level, and shipping from the same side at the front.

A new three story addition is under construction over the boiler room. This represents the completion of current building plans. Completed scheme will see fresh government inspected beef, pork, choice spices, other fine sausage ingredients and packaging materials arriving at the north side, rear. From there they will flow into their respective storages; refrigerated, air conditioned or dry warehoused as appropriate.

From storage, each ingredient will be moved up or down on elevators to the point in the production scheme of things where they will be used. For example, meat ingredients will move from cooler storages at basement floor to cutting and trimming rooms at the same level. Ready for chopping or fine cutting, they will then raise vertically to the new kitchen located over the boiler and machinery rooms.

Product then, depending upon the item, is routed to refrigerated spaces located on the second and third floors for labeling, or further processing, and then back to the first floor sales cooler and to the shipping point. In effect, the process flow describes a large "U" path through the building while being moved vertically from floor to floor at the various steps of production.

Varied Cooler Rooms

Refrigerated spaces at present number some eleven rooms. More than half of these have been remodeled; several are undergoing remodeling at present. Only two of the newer coolers remain to be modernized. In those cases, planned alterations involve removal of a brine air-wash refrigerated system which distributes air thru a perforated panel ceiling in curing and holding coolers.

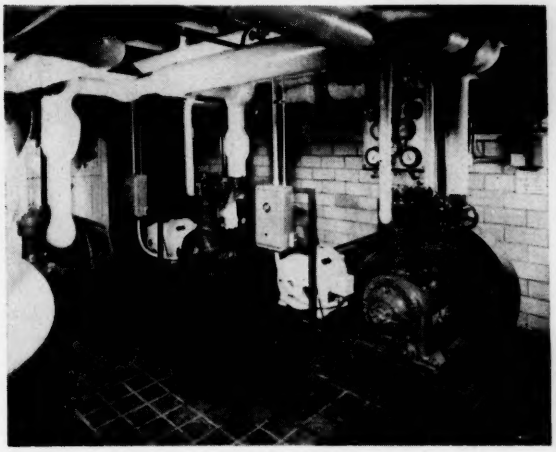
This air distribution system will be replaced with six Gebhardt units, using liquid ammonia recirculation. The brine system will be removed entirely, but the water cooled condensing unit which served it will remain on the top floor, as reserve or stand-by capacity. The compressor serving this system from the fifth floor is a 5 x 5 twin-cylinder two-speed unit.

Local delivery is by truck. Although refrigerated rail or truck is specified for out-of-city, Usinger's take no chances on unduly delayed deliveries. Corrugated tubes containing dry ice are inserted in each out-of-city shipment. Dry ice is scientifically cut, wrapped and inserted between shredded packing in such a manner as NOT to freeze the fine sausages.

Refrigerating Plant

Two 6-1/2 x 6-1/2 twin-cylinder 30-hp Howe compressors supply the compression required for the central ammonia refrigerating plant. A 4 x 4 (20 hp) compressor is used for standby and pump out. New or renovated rooms completed under phases 1 and 2 of the expansion program, are refrigerated by a gas pressurized liquid ammonia recirculating system.

Older rooms yet to be altered in phase 3, employ either direct expansion or a brine system served by the water cooled condensing unit on the top floor. These rooms will also be served by the plant pictured. The compressors shown replaced an old 8 x 16 Corliss steam engine driven horizontal compressor and a number of miscellaneous small compressors located on several floors.



View of the engine room located behind the trimming area at basement level in the Usinger plant. Like other areas of the plant, tile is used for finished surfaces. All refrigerating compression and condensing will be centralized in this area.—*Photo courtesy of Advanced Engr'g Corp.*

Located above the new shipping room is this combination cafeteria and locker room for Usinger's male employees. Female employees have new facilities on another floor. Women office employees also have a new lounge on the third floor.—*Photo Courtesy of Advanced Eng'r'g Corp.*

Water, a quantitative problem in Milwaukee, as in most metropolitan areas during the summer, is carefully used. City water is purchased and passed through the condensers. From there it flows to an old boiler now used as an incinerator. Used also as a reservoir, the old boiler now adds heat from burning waste to that of the condensers. The water then flows to the hot water tank and then to plant uses. Consumption averages 20,000 gals per day.

Automated Operations

With centralization of refrigeration equipment in one machinery room, the plant was wired up for automatic operation. Either Howe machine is used as the master, with the second cutting in as peaks require. Drives are 220 v, 3 ph, induction motors with across the line magnetic starters. A timing device prevents both machines from starting at once.

The new Keeler water-tube boiler is 125 hp capacity and is rated for 250% performance. Oil is used for fuel, but with slight alterations the boiler can be fired with coal. Gas fuel is used for standby. In addition, to the old boiler now used for an incinerator, a second old boiler has been retired to stand-by.

Series 100, ceiling suspended, Gebhardt units are the controlled refrigeration systems applied in each of the remodeled spaces. Of stainless steel construction, these units employ a number of patented features, including a method of re-vaporizing condensate which tends to reduce shrinkage of product. Bill Ames, representative, Advanced Engineering Corp., Milw., supplied the equipment.

TABLE I — Refrigerated Rooms For Product Storage

No's.	Location	Purpose	Status
1, 2, 3	Basement	Meat Receiving and Hold Over Coolers #1-42F; #2-25F; #3-34F	Pipe Coils Sched. For Replacement
4	1st Floor	Sales Cooler 42F	Four Finned Coil Gravity Units
5, 6	2nd Floor	Corned Beef, Beef Curing, 42F	Brine pipe coils being replaced with 4 forced RH air control units (each room)
7	3rd Floor	Chill Room 42F	Four forced air RH control units replaced brine deck
8	3rd Floor	Holding Room 42F	Four forced air RH control units replaced brine deck
9	5th Floor	Holdover Cooler 40F	Four forced air RH control units replaced brine deck
10	5th Floor	Labeling and Fresh Sausage Packing 46F	6 Units replacing brine-indirect air wash system
11	1st Floor New Addn.	Process Area For Grinding & Chopping Meats (Approaching A/C temperatures)	Gravity Units

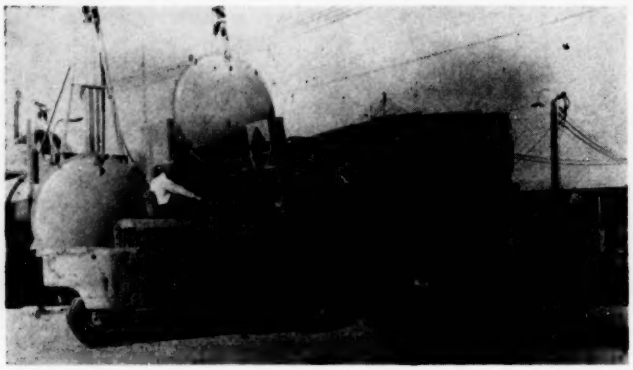
Refrigerant Leak Routes Miamians

▶▶ Truck equipment used by a milk company in Miami, Florida is apparently not equipped with the safety device suggested by the Safety Committee, National Association of Refrigerated Warehousemen*. Associated Press reported June 19 that 200 persons were routed from their homes at dawn when a truck driver pulled away from the dairy without detaching the ammonia hoses connected to his vehicle. A coupling broke, releasing liquid ammonia which evaporated into the air. Six policemen and householders were treated at a hospital, and scores of others at the scene involving a ten-block area. None were reported as suffering any burns or respiratory difficulties, following treatment.

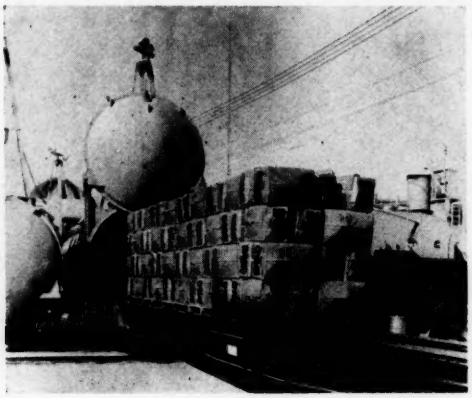
*See pages 18 and 20, Industrial Refrigeration, June 1958.

PORTABLE VACUUM DEVELOPEMENT

Six Trailer Mobile Unit Under Three Man Operation Pre Cools Six Cars Produce Per Hour



Half-carload of produce is the unit of material handling for Imperial Cooling's portable pre-cooling operation. This lift-truck places a half-car pallet-load on the rail operated Conveyco conveyor. Vacuum cooling tubes pictured chill one-half carload each cycle, alternating vacuum and refrigerating phases between them.



Traveling at 60 ft/min. the produce load moves into the pre-cooler tube as previous cooled product moves out for shipment. In right background is the trailer mounted steam generator for vacuum pumps and power generation.

By THOMAS A. DICKINSON
Special Correspondent

▶▶▶ PROBABLY THE LARGEST portable refrigerator yet constructed was recently put in operation by Imperial Cooling Co., El Centro, Calif.

It is, briefly, a vacuum precooling facility. Greatly lengthening the storage life of fresh fruits and vegetables by making it possible to chill such perishables within five hours after they are picked, it has the principal advantage of being usable in field locations where no public utilities are available.

An All-Season Facility

Compared with stationary vacuum precooling plants, some of which have now been in operation about ten years, the big portable unit should have the added advantage of being usable all twelve months of the year. Conventional installations, with few exceptions,* have been limited to operation during a single harvest period in a relatively small portion of Southern California or Arizona. Due to the small sizes of some crops, it has to date been commercially impractical to provide stationary vacuum precooling plants for many areas.

Besides serving growers in the latter areas, the portable plant will probably find some applications in localities where stationary cooling facilities now lack the capacities required to process unusually large crops.

Semi-Trailer Mounted

Portability of the new plant is attributable to the fact that its major components—including a pair of big steel processing tubes, two cooling towers, a boiler, and related equipment—are either permanently mounted or temporarily mountable on six large trailers.

As indicated by accompanying photographs, some of the equipment (notably, conveyors and fork lifts) must be removed from the trailers in order to be useful on any given plant site. However, all six trailers can be readied for movement by trucks in only 3½ hours; and, after reaching a new site, the entire plant can be put back in operation in 5½ hours.

Six Carload Capacity

In operation, either of the plant's 42-ft long vacuum tubes can handle half of a carload of produce in one processing cycle; and when both tubes are being used to capacity, as many as six carloads of field-packed vegetables can be processed an hour.

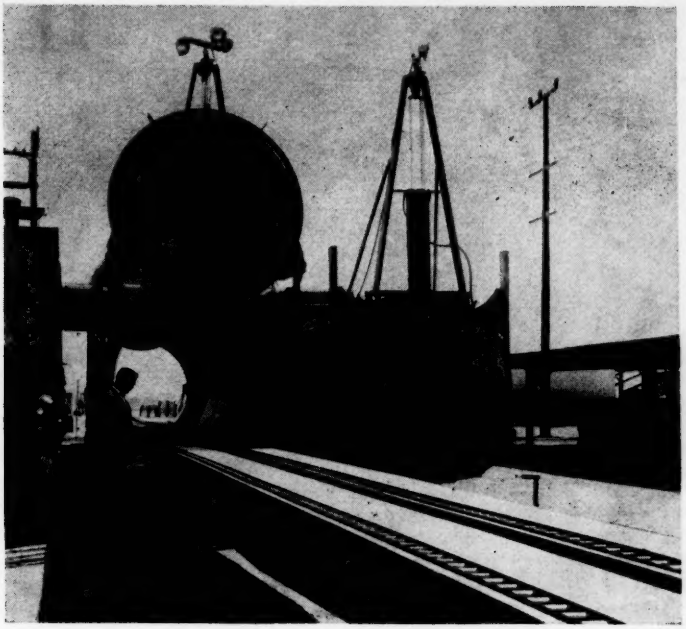
Tends To Destroy Bacteria

A processing cycle in each tube consists of reducing pressure therein to 29.92-in. of mercury with steam jet pumps, and then using refrigeration to reduce the temperature of a load to about 32°F. (the exact temperature in each instance depending on the type of perishables being processed). During such a cycle, a high vacuum not only tends to decimate the microscopic forms of life which cause spoilage; it saves much of the time required for conventional refrigeration (which, incidentally, merely forces most microbes to hibernate).

Provides Own Utilities

Operation of the equipment does not necessitate the use of utility power, because its boiler can be fuel fired to provide steam for both vacuum pumps and a generator—which, in turn, produces current for the plant's cooling apparatus. However, public power can be used for auxiliary drives and utility gas fuel in heating the boiler whenever it is economically feasible to do so.

*See "Crisp Lettuce With New Jersey's Vacuum Cooling Units," INDUSTRIAL REFRIGERATION, Nov. 1958, page 16.



Above, the twin tubes, each semi-trailer constructed also, are served by a mechanized Conveyco conveyor, rail mounted to alternately unload each tube. Vacuum and refrigeration equipment is in the trailer at extreme left.

Twin Tube Efficiency

Because produce cooling tubes are alternately evacuated and refrigerated, the boiler's output is continuously used with a high degree of efficiency in any event; and only two conveyors, each of which is rail-mounted for use at two different stations, are needed for loading and unloading purposes.

Built-in hydraulic jacks on the chassis of each trailer simultaneously facilitate stabilization of the plant and prevent wear on tires in the course of each production run.

Mechanized Operating

Rapid operation of the cooling tubes is made possible by elevator-type doors and rubber gaskets which permit the rapid sealing or opening of either component by mechanical means; also, by quick-opening valves which accelerate the introduction of refrigerated gases into the evacuated compartments.

Conveyor operations are electronically coordinated in such a way that a load of incoming produce can enter either tube as rapidly as a refrigerated load can be removed—at a speed of 60 ft. per minute.

Above, two semi-trailer mounted cooling towers serve the refrigeration system for the six-trailer portable vacuum cooling plant employed by Imperial Cooling Co.

Three-Man Crew

Loads of produce entering and leaving the plant are palletized so that they can be handled with a pair of fork lifts, each of which has the capacity required to move half of a carload in one operation. Consequently, full-scale production can be maintained with a crew of three men in ordinary circumstances.

Reefer Transport Required

After leaving the plant, produce may be continued in this preserved state with truck trailers, railroad cars, or storage rooms with conventional refrigeration—depending on the nature of transportation or storage facilities that are available or most desirable in each locality.

Refrigeration Improves Dry Milk Processing

▸▸DAIRY RESEARCHERS at the University of Wisconsin, late in March, reported on an improved dry whole milk process. Now being produced experimentally, the product mixes with water to give a reconstituted beverage much like fresh milk. Although some of the disadvantages have been overcome, flavor drawbacks still keep the product off the market.

The fresh milk flavor now lasts for only about 30 days at room temperature. However, when the dried milk is stored like many dairy products at cooler temperatures, the flavor quality will last for 60 days. Extended flavor quality has been achieved by storing at 0 F.

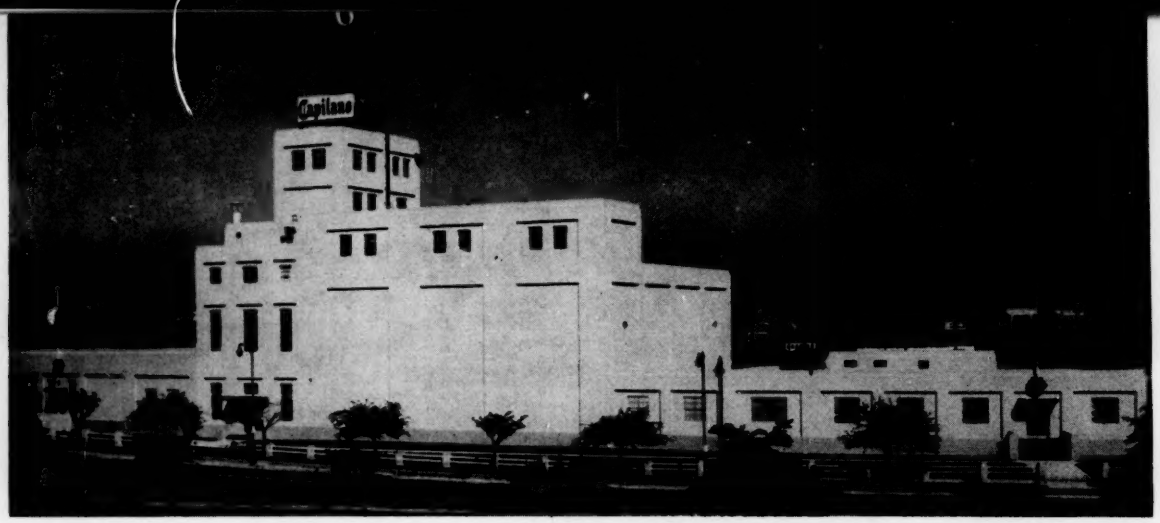
Temperature Conditioning

Variation of the customary dried milk process in the Madison, Wisconsin experiment occurs with a method called *temperature conditioning*. The milk is dried in films which are immediately placed in a chilling compartment. The films that are removed from the drier are chilled for at least an hour. This cooling is said to harden the fat and lessens the "smearing effect" which occurs during a crushing process when the film is powdered.

The smearing effect is reported to be the culprit which causes poor recombining qualities, according to the dairy scientists. By hardening the butter fat particles quickly, a tendency for a thin film of fat to coat the other solids is retarded. The ability of these other solids to soak up water is a prime factor needed for a good recombination. Milk that has already been dried can also be improved by temperature conditioning, according to the MILWAUKEE JOURNAL.

Dry Milk Promotion New Firm Objective

▸▸NEWLY FORMED patent licensing firm, Dairy Foods, Inc., Oakland, California, announced recently that S. L. Denning, former University of California dairy professor, has been elected executive vice-president and general manager. One of the first assignments of the new company, which is owned by Carnation Co. and Foremost Dairies, Inc., was the promotion of dry milk sales. Current national production runs in excess of 1½ billion pounds annually with a gross of over $300 million. Both companies have assigned their dried milk patents to the new firm, making them available to most free-world countries for development of dry milk processes.



Capilano plant of the Sick's Brewery Enterprises erected in Vancouver, B.C. in 1954 at a cost of $4 million dollars. Special consideration is given to sub-construction, insulation and mechanical piping for this type of construction in Western Canada.

▶▶▶ PROBLEMS the refrigeration engineer encounters in Canada are not met with by the engineer in moderate climates, such as Southern California. The soil, especially the silt-like type found on the Central Canadian prairies, taxes the ingenuity of engineers when designing heavy buildings. This soil is very deep in some places, and by its nature limits the use of piling for supporting heavy loads. For that reason, spread footings are generally used to provide low unit pressure on soils.

As the frost line, or depth to which the soil freezes, often reaches six to seven feet, the building footings must be located below this depth. It is essential that precautions be taken that it will not freeze below the footings which would cause expansion of the soil and subsequent heaving of foundations. Some buildings have been ruined because the builders failed to take the necessary precautions with respect to the frost line.

Adequate Drainage Needed

It is extremely important in the cold country that adequate drain tile systems be installed in order to drain moisture from the footing area. This practice maintains a soil condition comparable to the texture existing when the footings were installed. For that reason also all pipe lines for cold water, sewers, etc., must be placed at a depth of approximately eight feet and the footings of the buildings extended downward approximately nine to eleven feet.

In extremely cold climates, no pipe lines of any description may be installed outside of buildings, as is the practice in milder climates. All water, steam, compressed air, CO_2, roof drains, sewer vents, etc., must be inside the building where the temperature may be maintained high enough to prevent freezing.

Even brine and ammonia piping should be installed within the building to insure best results. Extreme cold may cause ammonia pressure to fall to such a low point that liquid may not be available up to the top of a five- or six-story building.

Inverse Insulation Practice

Insulation is another matter on which the engineer must readjust his ideas when he moves to the cold country. Practically all buildings in the areas of extreme cold must be insulated because of the relatively lower temperatures which range 40 to 50 degrees below zero in winter (and 80 to 90 F in summer).

Even the repair shops, engine rooms, store rooms, etc., must be insulated and heated to prevent sweating and deterioration of the building and its contents. Thermopane glass is extensively used in windows up there, even though it is rather expensive. Ammonia condensers of all types must be placed within buildings, usually in an additional story over the engine room. In Winter the daylight hours are only about six, and the reverse in Summer, with long twilight periods.

Interior Icing Conditions

The equal of seven inches of corkboard is required for adequate insulation of buildings in the cold areas of Western Canada. There have been cases in which the entire interior walls have been completely covered with ice and frost in some buildings which were not properly insulated, or in which the insulation was loose or badly deteriorated.

Insulation must extend at least six feet below ground level in basements, or below the frost line, for best results. An ever-occurring problem in the land of extreme cold, is where the vapor barrier should be placed on insulated walls. Should it be on the outside or inside surface of the insulation?

An engineer makes his choice, and in either case he may be in trouble. Cellular insulation materials, such as Foamglas, which acts as its own vapor barrier and is impervious to moisture throughout the entire thickness seems to be the best answer to the problem. Such insulating material, finished with white mastic interior plaster, is becoming quite popular in those areas of extreme cold, because it takes an enamel paint finish very well.

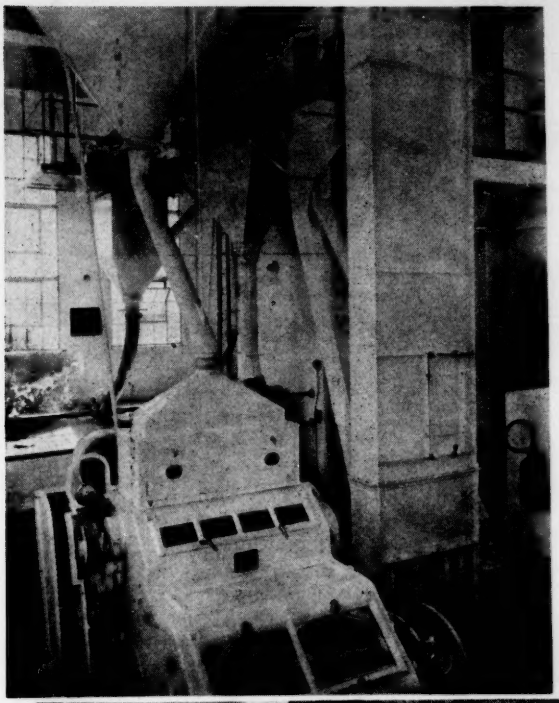
Partition Construction

Insulated partition walls have always been a problem because of lack of rigidity and shrinkage away from confining walls, ceilings and floors. In the North many such partitions are being constructed of self-supporting Foamglas, installed in two layers of 3-inches each and plastered on both sides with white mastic finish. This material has less tendency to expand or contract, leaving cracks and voids where it is in contact with existing buildings. Cracks in wall insulation finishes are very bad in a brewery as they may become breeding places for bacteria and mold.

Lighter Refrigeration Loads

Actual refrigeration demands are comparatively light in cold climates compared with that in Southern California. This is a factor which partially offsets the extra cost for insulation.

SUPERVISING MANY PLANTS CALLS FOR MANY TALENTS



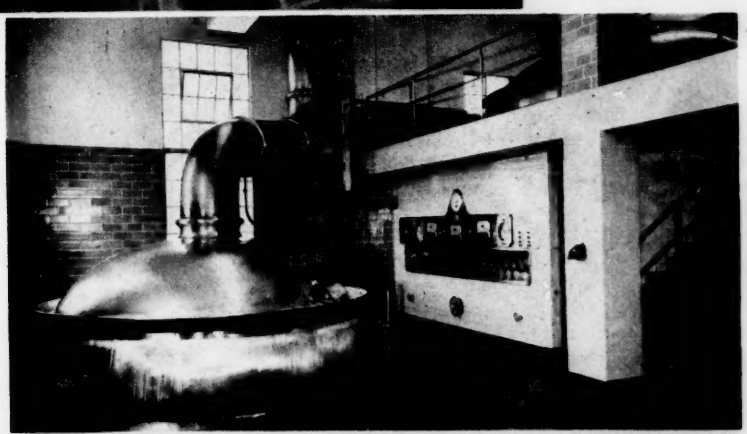
Colder Climate Building Problems

By M. E. BELL

As Reported To
FRED HERR, IR Correspondent

Construction And Insulation Practice In Some Western Canadian Breweries

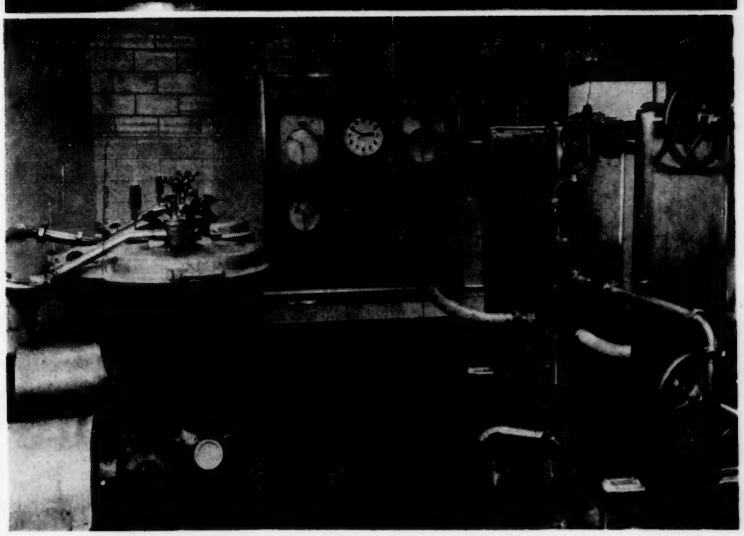
From the start of the brewing process — the malting of grain — to the shipment of the completed product, engineering applications are involved. Pictured here is the malt handling equipment installed in Sick's Brewery in Vancouver, British Columbia, in 1953. Pneumatic and mechanical conveyors plus weighing and grinding machinery are the responsibilities of the supervising engineer from the time of erection through the equipment life.



Quality brewing requires close control over process temperatures. Electric instruments and controllers, controller air supply, and maintenance of such equipment add to the duties of the engineering department. Panel mounted in the tiled partition wall controls the brew kettles on the left and on the mezzanine.

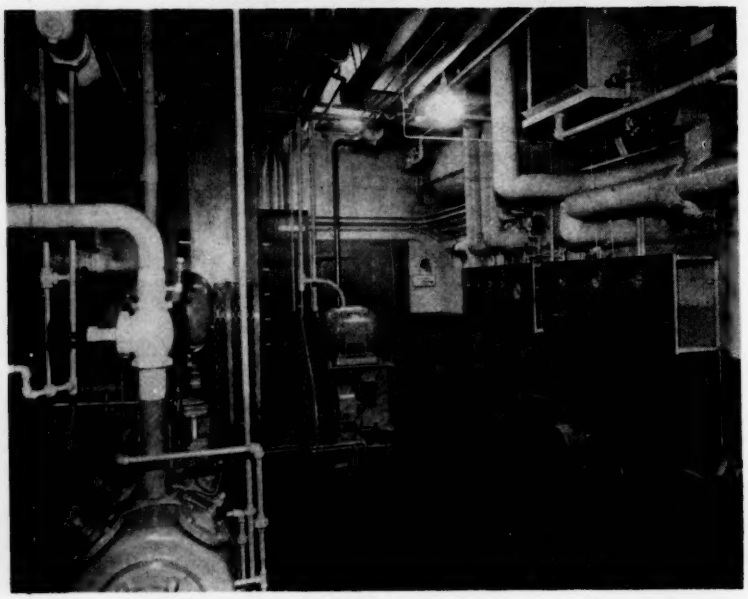
M. E. Bell

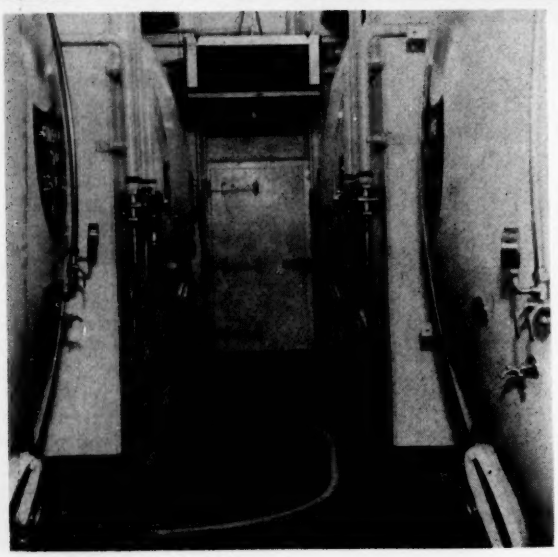
More ▸



Centrifuges on the left separate some ingredients no longer required in the process after the brew has been completed. The hot fluid (wort) is cooled in the plate type apparatus at the right, again under the control of the automatic instruments pictured on the panel. Refrigeration plays its first important role at this point in the process. This scene is the Sick's Ranier Brewery at Spokane, Washington.

Fermenting cellars are refrigerated by various methods and CO_2 produced by the process must either be released to atmosphere or collected. This cellar, Sick's Ranier Brewery, Spokane, is typical. The Spokane installation was completed in 1950.





CO_2 compression and liquefying equipment at Sick's Spokane installation. Bulkhead on which the electric controls and the gauges are mounted, conceals a liquid CO_2 storage tank with 25,000-lb. capacity.

Heat Cellars In Winter

Often the fermenting cellars of breweries in Canada must be heated in Winter to maintain temperatures of 45 F. Outside temperatures at the time may be as low as minus 50 F. Comparatively small so-called steam unit heaters are used so that they may be removed in Summer and again replaced in Winter.

Most of the old pipe coils have disappeared in that section of the continent and have been replaced by air units. There is still considerable difference of opinion concerning the use of large units with distributing air ducts or several smaller units strategically located so that no air ducts are required. Both have their disadvantages: ducts pose the problem of interior cleaning; and, usually, smaller units are inaccessible, offering the problem of maintenance of fans, motors, controls and defrosting.

Defrosting Avoided

The defrosting problem may be overcome in cellars of high temperature if sufficient surface is provided and higher than normal air velocity across the face of the coil is maintained. This surface should be sufficient to provide 8 F temperature difference and the air velocity of approximately 500 fpm. Under these conditions frost will not form on the unit. Periodically the refrigerant may be shut off, and the fans allowed to continue operating to dry the coils.

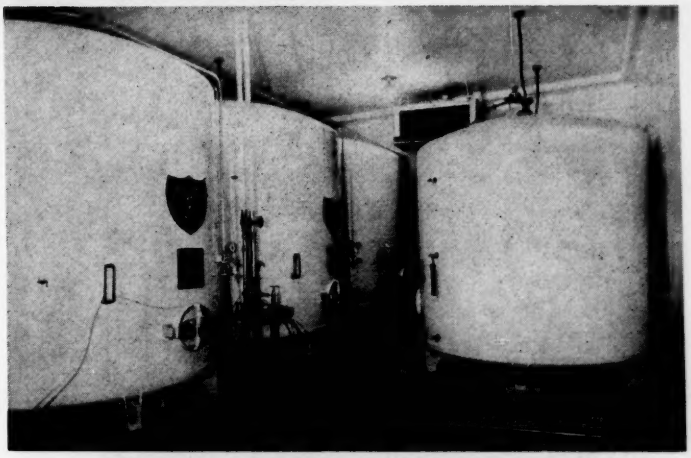
These areas and velocities may seem too great to some, but experience has shown the practice to be successful and much appreciated by the operating crew.

Refrigerating equipment rooms outside of the areas to be cooled, and serving two or three floors, sometimes at different temperatures, have been successfully installed in the Western Canadian provinces. All air cooling evaporative units are placed in this room and cold air is forced into the space to be cooled, then returned to the units in the equipment room by gravity. In this manner a positive pressure is maintained on the product rooms, preventing any outside, objectionable air from entering the cellars or open tanks. In such installations, all the ammonia, water piping, air filters and electrical equipment is confined in a small, easy-to-service space.

Finishing tanks at Sick's Vancouver, B.C., Brewery are pictured here. The cellars in which the tanks are located are refrigerated by means of ceiling hung evaporative units minimizing floor space requirements for refrigeration.

Engine room of the Vancouver plant is pictured. Considerable space is provided here for additional machinery, the plot having necessary space for additional cellars which would be required for expansion.

Bottling tanks in the Vancouver installation are located in a refrigerated cellar which also employs ceiling hung refrigerating units.



About the Author:

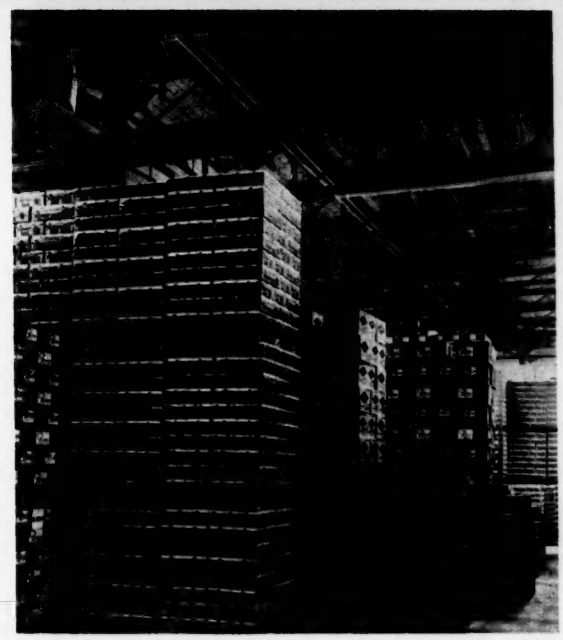
Former Brewery Supervisor

▶▶▶ PROFESSIONAL ENGINEER M. E. BELL is now general manager, Associated Refrigerating Engineers, Inc., Los Angeles. Returning to Los Angeles in mid-1958(he had served for 8½ years as Supervising Engineer for Sick's Brewery Enterprises, operators of breweries in Northwestern United States and the Western Provinces of Canada. He directed work in connection with the expenditure of some $15,000,000 for one completely new brewery and the modernization and rebuilding of six other plants.

Most of these projects were located in the Canadian Provinces of British Columbia, Alberta and Saskatchewan. The Winter temperatures in that area, which go down to 40 and 50 degrees below zero, pose problems which are completely unknown to refrigeration men in the non-freezing climate of Southern California.

In connection with his talk on "Some Building Problems in Cold Climates", Bell showed several dozen slides illustrating various projects which he designed and installed in Canada and the state of Washington. How the extremely cold temperatures which prevail in Canada demand radically different conceptions of installation and insulation, was the main theme of his discourse.

Bell is now second Vice-President, NAPRE, having been elected to that position at the annual meeting in Miami last Fall, eight days following this presentation to the Los Angeles group. He had been a Director of NAPRE for several years, and is a past officer of Seattle, San Francisco and Los Angeles chapters.

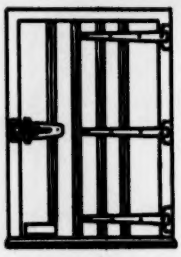


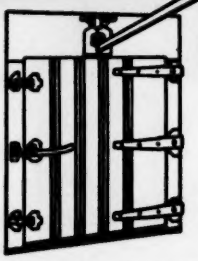
Typical of packaged goods storage building is this structure completed by Sick's Brewing Enterprises at Seattle.

"Butcher Boy"

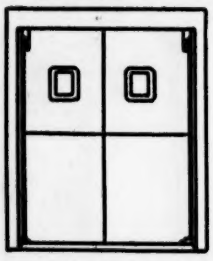
Since 1885

EXCLUSIVELY ENGINEERED



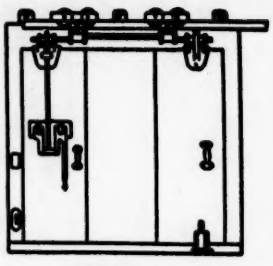


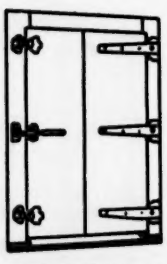
STANDARD COOLER-FREEZER DOORS

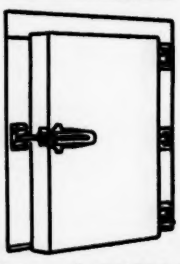


STANDARD VESTIBULE AND AUTO-CLOSE DOORS

HORIZONTAL SLIDING DOORS (Manual)







LOW TEMPERATURE INFITTING and OVERLAP

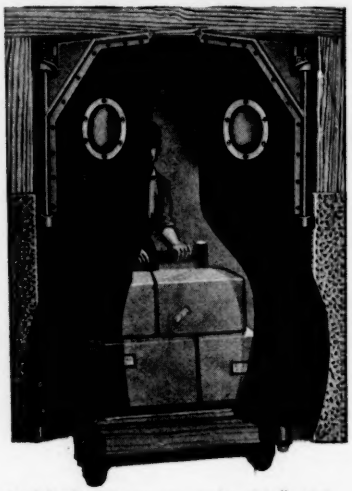
AUTOMATIC ELECTRIC DEFROSTERS WITH THERMOSTAT CONTROL

CATALOGS AVAILABLE UPON REQUEST

FLEXIBLE RUBBER BATTEN DOORS INCLUDING STANDARD DOOR FRAME at no extra cost!

TYPE "TSH" WITH SEMI-HEIGHT MOUNTINGS

Especially adaptable for smaller door openings.



THEY PERMIT

1. Safe passage of hand or power operated equipment with wider pallet loads.
2. Corner cutting with hand and power trucks.
3. Repeated abuse from impact of trucks at minimum damage and maintenance costs.

Model TSH battens are made of ¼" thick Neoprene (no grain) or of ¼" tough specially compounded rubber, reinforced with 2 layers of heavy cotton duck. Materials remain flexible even at extremely low temperatures.

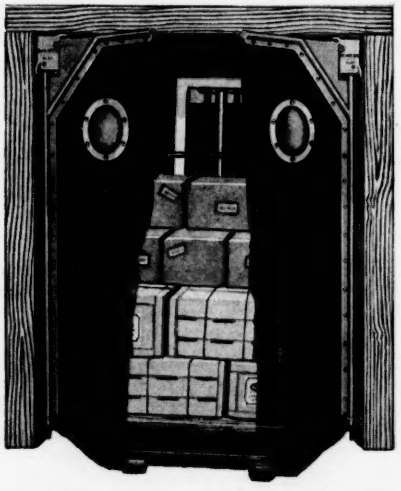
Model TSH battens are furnished with No. 12 gauge galvanized steel jamb guards applied 4' 0" high with *no protrusions into the clear door opening.*

TYPE "FH" WITH FULL HEIGHT MOUNTINGS

Designed for wider and "straight traffic" doorways.

ADVANTAGES

1. Loss of refrigeration is held to a minimum.
2. Extra rigidity — tighter doorways.
3. Eliminates exposure and drafts near loading docks or at other openings.
4. Flexibility of battens permits repeated abuse and shock of mobile equipment contacts.
5. Permits movement of trucks and pallets at high speed in and out of refrigerated or other storage areas.



Model FH battens are made of ¼" thick Neoprene (no grain) or of ¼" tough specially compounded rubber, reinforced with 2 layers of heavy cotton duck. Materials remain flexible even at extremely low temperatures, and will not tear under most severe conditions.

BUTCHER BOY REFRIGERATOR

REFRIGERATOR DOORS

Electro SAFETY-SLIDE HORIZONTAL DOORS

FEATURING STRUCTURAL SIMPLICITY

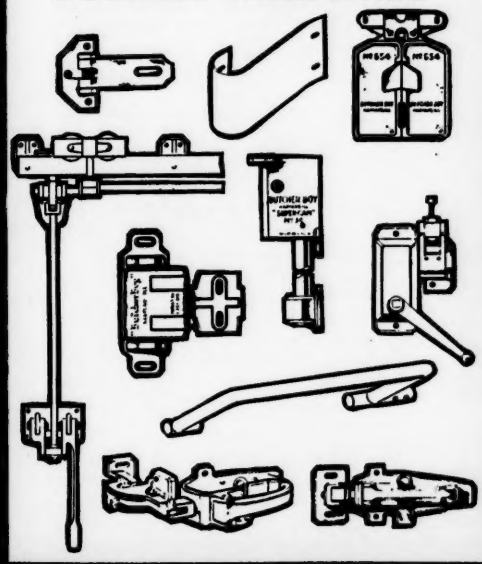
MECHANICALLY SOUND
COMBINED "SPEED AND SAFETY"
EXCLUSIVE AUTOMATIC SEALING "Gasket Assembly"
SIMPLIFIED INSTALLATION

Bi-Parting Horizontal Sliding Doors Available. CAUTION: Not recommended for use in cooler or freezer areas. Bi-Parting double horizontal sliding doors, of necessity, require gasket seals where the doors meet at the center of the opening. Hence, gaskets must be applied at "vulnerable" areas, exposed to contact by trucks or other objects which will rip or tear the gaskets, thereby destroying the necessary seal between the doors. *Field experience dictates this precaution against the use of bi-parting sliding doors.*

14 OUTSTANDING FEATURES

1 Overhead chain drive.
2 COMPACT—Electric Power Operator Assembly.
3 Heavy malleable iron Hanger Brackets.
4 Hyatt roller bearing Door Bracket.
5 Manual "Safety Release".
6 Automatic Sealing Assembly.
7 Automatic Electric Defrosters.
8 Concealed electric systems.
9 Safety Edge.
10 Complete Frame metal clad.
11 Special "SEAL" and "SILL" gaskets.
12 Defroster Drain Outlet.
13 Manual "Interior Safety Release".
14 "Roller-Type" Floor Wedges.

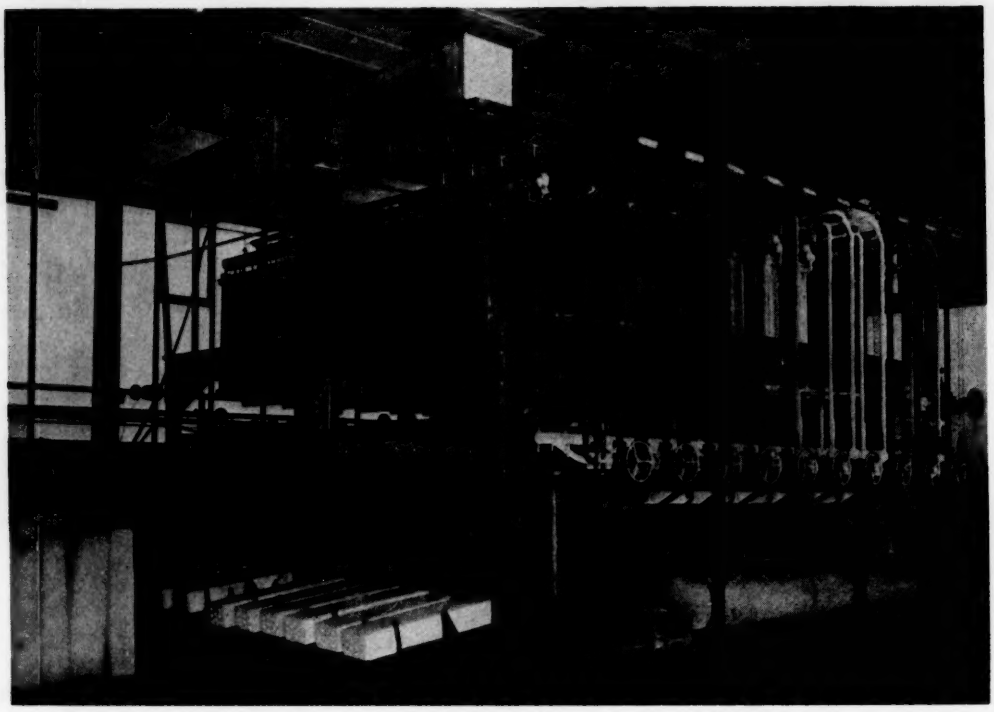
DURABLE HARDWARE



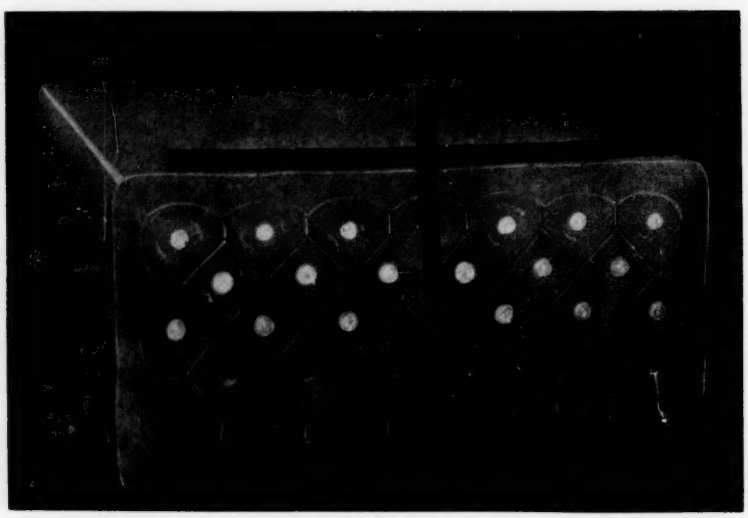
DOOR CO., Dept. "R"

U. S. FIRM GETS RAPID-ICE RIGHTS

Pappas To Manufacture Process Apparatus



Typical of Rapid-Ice plant installations is this 60-ton capacity unit, which is producing 8x12-in., 112-lb blocks from seawater in less than two hours, including six min. filling and three min. thawing. Area required here is 16x19-ft. It is a one-man operation.



This 336-lb Rapid-Ice block leaves the mould at minus 11 C (12 F). Peculiar ice zone formations are outlined. Freezing area around each needle or probe meets to form a square. The square edged ice sticks are claimed to provide the same reinforcing qualities to the block, as steel rod gives to concrete. Strong, durable transport qualities are achieved, it is said. (Seawater Rapid-Ice leaves the unit at minus 20 C (minus 4F) and is said to have little separation of salt, making it particularly suitable for fish and seafood preservation).

▶▶▶NEARLY A DECADE has elapsed since the Rapid-Ice method of ice making was introduced into the United States[1]. Early in June this year a Texas firm announced the construction of a plant at Houston for manufacturing the equipment required for production of Rapid-Ice.

Pappas Industries, Inc. has obtained patent rights on this European ice-making machine. The Houston firm, headed by Pete Pappas, president, has purchased rights for the machine from Rapid-Ice Freezing Ltd. of Zurich, Switzerland.

The American firm, Pappas said, has acquired all manufacturing and distribution for the United States, its territories and its possessions. In addition, the Pappas' Company holds U. S. rights to three separate patents and processes owned by Rapid-Ice Freezing, Ltd.

[1]Rapid Ice Freezing System; Eugene Wilbushwich; ICE & REFRIGERATION—(predecessor of INDUSTRIAL REFRIGERATION) August 1950, page 13.

Construction of First New Method Industrial Icing Plant Underway

First U.S. Manufacturer

In order to build the revolutionary new ice-making machinery, Pappas Industries will build a plant in Houston at a cost of approximately $500,000. "Our proposed plant, which is still in the blueprint stage, will manufacture machines that will turn out block ice, cylindrical tube ice and ice for quick freezing of food products", Pappas stated. The plant will manufacture most of the component parts of the Rapid-Ice machine.

First U. S. Installation

One complete installation has been sold to the San Antonio Produce Terminal Market. This will be the first installation of a Rapid-Ice plant in the United States.

The San Antonio project will have a daily ice-making capacity of 100 tons, and storage facilities for 800 tons of ice which will be used primarily for icing large vegetable shipments for mid-West deliveries as far north as Chicago.

This plant will also sell ice to railroads for icing cars carrying other perishable food products. The new installation which will be almost completely automatic in operation, will be functioning late in August, this year. It will have 23 harvest stations on a 240-ft conveyor.

Reduced Plant Space

Rapid-Ice systems with capacity ranges of one to 500 tons per 24-hour production, occupy one-fifth to one-seventh the floor space used by brine tank type ice plants. It is indicated also that Rapid-Ice plants use much less electrical power than the brine type plants, thus cutting operational costs, Pappas pointed out.

There is still a large demand for block ice in the U. S. especially for such purposes as cooling transport vehicles, chemical process work and for packing perishable foods such as fish, produce, poultry, etc. Pappas declared, "There is also a great demand for a machine to replace costly outmoded brine tank ice plants. We believe that the Rapid Ice equipment is the only major change in block ice making since the inception of the industry".

Principle of operation is simple. Ice is made by direct expansion of refrigerant in a jacket surrounding individual moulds. Refrigerant in needles which project downwards into the center of the block freeze the core as quickly as the remainder. Ice thus produced may be opaque or made commercially clear by the introduction of air agitation.

The moulds, which are open at the top and closed at the bottom by hinged aluminum flaps, are arranged on a self-supporting structure. The hinged flaps have no sealing joints, but are made watertight by freezing them to the bottom of the moulds. Each mould is then filled with a controlled quantity of pre-cooled water by the operation of a single valve.

Hot Gas Harvesting

When the blocks of ice are ready for harvesting, hot gas from the compressor is circulated through the system. Changeover from freezing to thawing is effected by the operation of a second valve, the spindle of which is turned through an angle of about 90 degrees. Thawing losses are very small, as each block leaves the mould within two to three minutes. Therefore the ice does not lose its weight by being over-thawed.

The blocks of ice then drop through the flaps onto a harvester which is positioned below the row of moulds to be thawed. Harvest is then automatically lowered to the ground.

Ice produced by the Rapid-Ice system may be sub-cooled to 12 F and stores well. The ice remains dry after crushing and does not stick together. Owing to the rapid freezing process, crystals are small and blunter than those produced by the slower freezing of tank ice plants.

Simple Operation

Control of the plant is very simple. Unskilled operators can be more easily instructed and within a short time operate with competence and safety. No brine is used in the system making it possible to operate the compressor at a higher evaporation pressure with consequently higher efficiency. As there is no brine, neither calcium, sodium nor other chemicals are required so that cost of ice production is reduced accordingly.

Maintenance is reduced to a minimum as the ice-making unit in a typical plant is limited from four to eight rows of moulds. These moulds are steel plates, sturdy in construction and stationary in service. There is no wear and tear.

The Rapid-Ice system of block ice manufacture uses ammonia as its refrigerant, but the plant can be built to accommodate use of other refrigerants.

RAPID ICE ADVANTAGES OVER BRINE TANK SYSTEMS

Space: No brine tanks, No dip tanks, No can fillers.

Drives: One electric motor required; No brine circulation motors, No crane motors (In areas with intermittent or no electric power supply, a small internal combustion engine is the only drive needed.

Economy: First Cost, Operation, Maintenance are all lower as evidenced by space saving and single drive. Manpower and variable capacity savings are augmented by the efficiency of direct expansion over brine. Salt and chemical treatment required for brine is obviated.

Corrosion: Salt corrosion inherent with brine tanks, brine pumps, mixing tanks, salt storage, etc. is non-existant. Therefore, corrosion is largely reduced to fresh water and climatic problems.

Man Power: One operator up to 300 tons.

Semi-Portable: Readily and easily disassembled and moved from site to site.

Variable Capacity: Conveniently started or stopped. Since freezing time of a block is three hours, plant may be used economically for a few hours each day during periods of reduced output.

Multi-Application: Adapted easily to commercial production of seawater ice; May be used for sludge freezing or solidifying of chemical compounds; or Applied to block freezing of foods, and food concentrates.

Block Ice Makes Store Moving Easy

▶▶ FOURTEEN 100-lb. blocks of ice served as jacks to lower a large fruit store onto a new foundation at Santa Maria, Calif., recently. The customary large beams had been placed under the frame building for moving on dollies and rollers. However, then the contractors located the structure over the new foundation, it was determined that 20 heavy duty building jacks would be required to hold the building up while the beams were removed.

A sufficient number of jacks just weren't available in the Santa Maria area at the time. Therefore, Duane Carter and Leslie Leach, the contractors, purchased the 14 blocks of ice, put the ice on the concrete slab foundation, lowered the structure on the ice and removed the beams. According to the Associated Press, the ice melted during the second day and the structure settled precisely in place. Carter's wife picked up the idea from an old newspaper account.

Dairy Associations Actively Promote Milk Products, Refrigeration Abroad

DSI Demonstration Center Of Madrid Show

▶▶EXPECTED TO BE the center of attention at the International Trade Fair, Madrid, Spain, May 23 to June 23, is the Dairy Society International's complete working dairy plant. The entire U. S. display demonstration is built around the dairy where recombining milk and ice cream from nonfat dry milk and anhydrous milk fat will be sampled by Fair visitors.

The dairy demonstration has chosen to highlight the U. S. fair exhibit because Madrid is an area where there is a real need for a market milk supply. Pasteurizing is limited, according to information reaching DSI. Cattle in the area are unable to give the city's potential milk requirements. Recombining has created a great interest among Spain's dairy officials who seek to supplement the local supply with a quality product.

Manning the display which is the Dairy Society's third such showing in Spain, are Gordon Lamont of Darien, Connecticut, Nestle director and chief-of-mission; Dr. Paul E. Elliker of Corvallis, Oregon; and Francisco J. Bazo of Cincinnati, Ohio. Bazo, an experienced diplomat, is a graduate of California State Polytechnic College.

Milk Surplus Moved

Ingredients will be furnished by USDA's Foreign Agricultural Service, which is in charge of the U. S. participation. Lamont previously planned two long-term educational projects in Colombia and Thailand. Dr. Elliker, on sabbatical leave from OSC, will attend the 15th International Dairy Congress, London, following the close of the Fair.

Two additional Trade Fairs on the Society's future docket are one in Madras, India, in the Fall and the other scheduled for Bombay. Previous International Trade Fairs participation has been in Colombia, Dominican Republic, Spain (Barcelona 2), Japan (2) Yugoslavia (2), India (2), Thailand, Greece, Turkey and Brazil.

Equipment for the Madrid Agricultural Fair is supplied by a large number of U. S. manufacturers, among whom were the Emery Thompson Machine and Supply Company in New York; King Zeero Company, Chicago; Savage Ice Cream Cabinet Division, C. V. Hill & Co. Inc. Trenton, New Jersey; Taylor Instrument Companies, Rochester, New York, and Vapor International Corp., Chicago.

Phillipsen Appointed DSI Organizational Director

▶▶FOLLOWING a recent Board of Directors meeting in Boston, Dairy Society International's managing director Roberts Everett announced the appointment of W. L. Phillipsen to a new post of Organization Director. Phillipsen, 38, is former general manager of the American Dairy Association of Wisconsin.

Phillipsen will be responsible for membership activities in DSI's world wide introducing of milk and dairy products into the diets of countless millions of persons who lack these essential foods. The Society develops new commercial markets in milk-short areas of the world.

Davison Replaces Wilhelm As Dairy Supply Executive

▶▶ELECTED Vice-president of Dairy Industries Supply Association was R. O. Davison of Kelco Co., at the DSI's 40th Annual Meeting in New York early this Spring. He replaces Russ B. Wilhelm who had resigned. Re-elected President was D. G. Colony, Manton-Gaulin Manufacturing Company, Inc.; Roy E. Cairns, Waukesha Foundry Co., treasurer.

Wilhelm resigned due to other assignments which would lessen his business ties with the dairy field. Results of an election to fill seven vacancies on the 18-man Board were announced by Luke M. Noland, Mojonnier Bros. Co., election chairman. Elected to the board for the first time is At-Large Director Howard H. Cherry, Jr., president, Cherry-Burrell Corp. At-large Directors re-elected for three-year terms, Ralph F. Anderson, Anderson Bros. Mfg. Co.; Roy E. Cairns, George L. Huffman, Ex-Cell-O Corp., Pure-Pak Division; and E. B. Lehrack, The Creamery Package Mfg. Company. Re-elected Commodity Directors are Sidney E. Crofts, Batavia Body Co., Inc., Delivery; and Mr. Colony, Processing and Handling Equipment and Components.

Said to be one of the most provocative meetings, the DISA met late in March at New York's Roosevelt Hotel with over one-half of the membership present. Speakers of the 2-day session included Alvie J. Claxton, vice-president and National director of Trade Relations for Beatrice Foods Co., who spoke on Basic Research; Dr. Charles E. French of Purdue University who theorized on reasons for changes of ownership of fluid milk plants; Dr. O. Glenn Saxon of Yale University, who discussed the wave of mergers which has regularly occurred in the United States after every major war since the Civil War.

Larry N. Lucas, vice-preisdent of The Bastian Blessing Co., Chicago, Ill., became the eleventh person to receive the Honor Plaque awarded for outstanding service to DISA. Mr. Lucas first became active in DISA affairs in 1946 as a member of the Exposition Credentials Committee, of which he subsequently served as vice chairman or chairman for many years. The Honor Plaque is presented only on occasions when it is deemed highly merited. In DISA's 40 years, only 11 plaques have been struck.

Set Miami Beach For 1959 Dairy Conventions

▶▶MILK AND ICE CREAM conventions for three of the industry's associations will be held in Miami Beach, Florida, the week of October 4. The International Association of Ice Cream Manufacturers will hold its 55th annual convention, October 5 to 7. I. H. Hagen, Uniontown, Penn., is president of IAICM.

The Milk Industry Foundation will hold its 52nd annual meeting October 7 to 9. A joint general session of IAICM and MIF will be held on the 7th. Hubert Garrecht, Memphis, Tenn., is president MIF. The Dairy Industry Supply Association will assist the processing groups with convention activities and entertainment, but more important will stage the Collegiate Students' International Contest in judging dairy products which is co-sponsored by the American Dairy Association.

Technical Session Planning

Advisory Board of IAICM Production and Laboratory Council met in New Orleans late in April to plan the technical sessions for the 55th meeting. Automation, present and future will be a top consideration. Problems encountered and improvements to be made in automatic production systems will get top billing through special accent on 2-way communication between speakers and audience during the technical sessions.

Ultra high teomperature pasteurization and cooling considerations will also be a feature, including equipment and installation problems. Handling and utilization of personnel in multi-purpose plants manufacturing under one-half million gallons of ice cream per year will be another highlight of the Fall ice cream makers get-together.

NAFFP Offices Move

▶▶ HEADQUARTERS of the National Association of Frozen Food Packers have been moved from 1415 K Street, N.W., in Washington, to 919 18th Street, N.W., it was announced late in May. Formal opening ceremonies at the new headquarters will be held late in June, Lawrence Martin, Association Secretary-Manager, announced.

Michigan Harriss Pie Co. Joins Frozen Food Packers

▶▶ PACKERS of frozen fruit and cream pies, Michigan Lloyd J. Harriss Pie Co., Saugatuck, joined the National Association of Frozen Food Packers on June 15, according to Lawrence S. Martin, Secretary-Manager of the Association. Michigan Lloyd J. Harriss has its principal office and plant at Saugatuck and freeze by the air blast method. Lloyd J. Harriss is president of the Michigan firm. Vice-president of the operation is F. Hansen. Barney Lambers is also a vice-president and chief engineer.

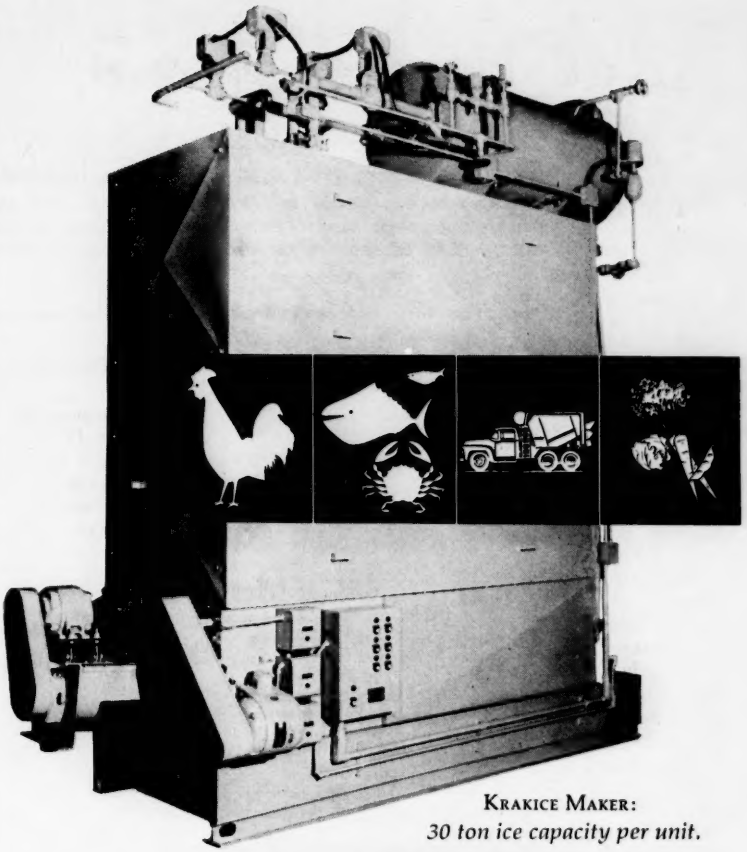
Morton Frozen Foods Division Also Joins Packers Group

▶ Continental Baking Company, Morton Frozen Foods Div., also joined the packers association in June. The Morton Div., packers of chicken, turkey, fruit and similar pies, in addition to dinners, casseroles and other bakery products made application to NAFFP over the signature of George R. Vail, vice-president of Continental. The Morton Frozen Food Div. has main offices at Rye, New York and plants at Crozet, Virginia and Webster City, Iowa.

Ward Baking Company Purchases Johnston Pie

▶▶ ACQUISITION of Johnston Pie Co., Los Angeles, was announced recently by the Ward Baking Co. Johnston is a major West Coast producer of frozen pies for the retail trade and fresh pies for the restaurant business. They are reported to serve approximately 2500 restaurant accounts in Los Angeles and supermarket chains in 11 western states, including the new states of Alaska and Hawaii.

The announcement came from R. Arnold Jackson, president, and James A. Kirkman, vice-president for marketing, Ward, Elwood Johnston, president and Theodore Tepper, vice-president and partner, Johnston. According to FROSTED FOOD FIELD this is the second recent diversification entered into by the Ward firm. Previously they had announced a joint venture with Gerber Products Co.



KRAKICE MAKER:
30 ton ice capacity per unit.

New Kohlenberger

KRAKICE MAKER

Solves Any Crushed Ice Requirement

Poultry, fish, concrete aggregate, vegetables ... Wherever crushed ice is used there's a place for Kohlenberger's new Krakice Maker. Now you can get higher ice yield per cubic ft. of space occupied. Kohlenberger's Krakice Maker delivers clearer crushed ice in larger quantities faster than conventional models. No fine adjustments are necessary and the need for knives or scrapers to remove ice from plates has been eliminated. Available in 15, 30, 45 and 60 ton units. Write for detailed information.

When quality and dependability count... contact Kohlenberger!

Kohlenberger services include:
Equipment Manufacture • Refrigeration System Design
Plant Layout • Field Erection

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DEPENDABLE REFRIGERATION SINCE 1922 · FULLERTON — CALIFORNIA

ENGINEERS
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CONTRACTORS

1610 COMMONWEALTH AVENUE, FULLERTON, CALIFORNIA

NAPRE QUESTION BOX

H. P. Hayes

HAVE A QUESTION? Address it to Prof. Harold P. Hayes, Dean of Engineering, State Polytechnic College, San Luis Obispo, Calif. Answers appear monthly in this department on problems forwarded by NAPRE members. Comments from all readers welcomed.

Determining Ice Capacity From Manufacturers Charts

QUESTION: Would you please explain how York Corp. finds the tons of ice made by Model DER-150A flake ice machine. The accompanying chart appears to be lacking complete instructions.—T.S., Oregon.

ANSWER: Apparently your original chart (Fig. 1) has been copied or redrawn from an earlier performance data graph. A new capacity selection graph and performance data chart (Fig. 2) used for this answer.

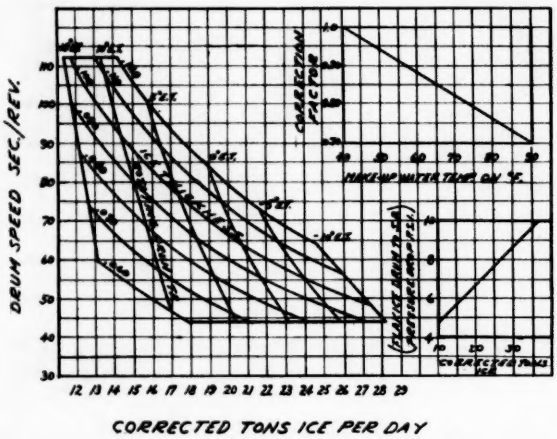

Fig. 1—This chart was obsolete. Probably for older equipment.

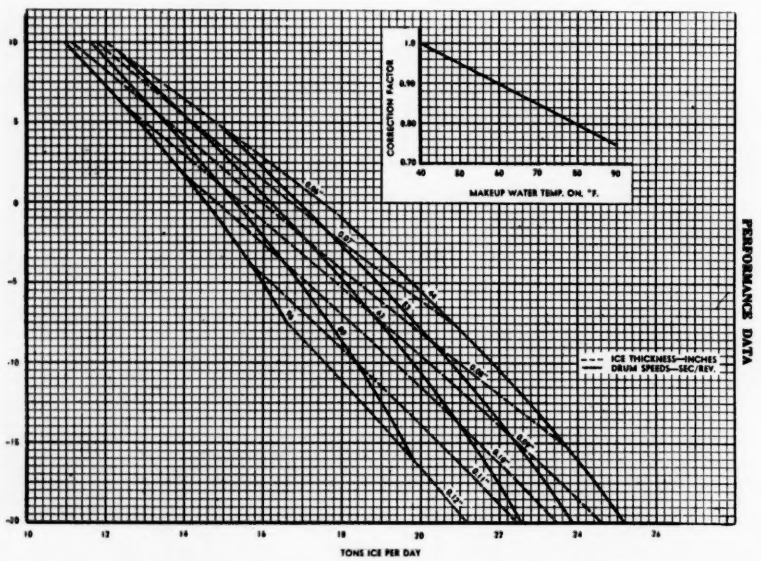

Fig. 2—Current literature for ice-maker contains this chart.

To select the ice maker in this model which would provide maximum capacity where the thickness of the ice is not specified, at minus 5F suction and 75F available water, proceed as follows:

From Fig. 2, (using the large graph) a standard drum speed of 44 sec/rev. (reading the solid line) will produce 19.7 tons of .066-in. thick (note the dotted line) ice at minus 5°F surge drum temperature with 40°F water.

Correction factor (now using the small inset graph) for 75°F water is .825, making the net capacity.

19.7 x .825=16.3 tons.

L.R.C., Chief Engr.
York Corp., Pacific District.

Starter Blows Fuses Motor Won't Start up

QUESTION: When starting up a compressor with the "start" button—the compressor immediately stopped when the button was released.

When re-starting—the "start" button was held in longer than usual and the fuse in the starting switch blew.

(1) Why didn't the compressor keep running on the first start-up?

(2) Why did the fuse blow when the "start" button was held in?

—C. C. S., Ch'go.

ANSWER: Concerning the start of this compressor, we can only write in general terms as there are, of course, many possibilities:

1) The compressor stopped when the start button was *released*. Motor starter control circuits have some means of maintaining a start button which, itself, of course, is a momentary contact. This will usually be an auxiliary contact on the starter switch itself, or a contact on a control relay in the case of larger size starters. Many times also, in series with this maintaining contact, will be an oil pressure switch or other interlocking device.

When the start button is depressed this bypasses any external interlocking or safety devices and will do so as long as the start button is depressed.

When the start button is released, however, it is necessary for this external circuit to be closed or the motor will immediately stop, due to the starter opening the contacts. From this it would appear logical to first investigate external interlocks or safety devices such as pressure switches, oil pressure contact, or pump interlock.

2) If the fuse blew when the start button was held in, several things could have contributed to this. First, it could be due to the fact that the motor was being re-started a short time after the initial start. The fuse elements had already been warmed up due to the initial starting current. The fuse may have been heated up to the extent that the second time starting was sufficient to cause a fuse to melt.

However, another possibility would be that the compressor had more than normal loading and, therefore, because the accelerating time was slower, it was necessary for the fuse to carry the starting current for a longer period, thereby resulting in melting the fuse. This could be checked by obtaining a time delay curve of the fuse and determining the melting time for the motor starting current.

—W. L. "Ideal" Tiffin,
Sec'y, Chicago Chapter.

Winding, Personnel Hazards With Motor Capacitors?

QUESTION: Why is there much concern shown about the application of capacitors to squirrel-cage motors in industrial plants and central station air conditioning systems? Apparently there is some possibility of motor damage with an improperly sized capacitor bank, even after disconnect. Also is there some danger to maintenance personnel due to transient current? —A.E.R., Milwaukee.

ANSWER No. 1: This question was probably prompted by paragraph 4606, National Electrical Code, which states, "The total kilovar rating of capacitors which are connected on the load side of a motor controller shall not exceed the value required to raise the no load motor power factor to unity".

A greater value of kilovars than this will cause the motor to become self-exciting during the shut down period, so that a voltage can be obtained from the open terminals. At the same time a larger amount can cause this generated or self-excited voltage to exceed the normal rated voltage of the motor, thereby creating possible breakdown to ground.

In any event a hazard exists to personnel who might accidently come in contact with these open terminals. —C.P. Robinson, Mansfield, Ohio.

ANSWER No. 2: Applying capacitors to an induction motor results in many of the same benefits which can be derived from the use of synchronous motors. The improvement in power factor results in lower running currents, which means that less transformer capacity is required, wire sizing is held to a minimum, and the number of conduits required for the wiring is also sometimes reduced.

Capacitors cannot be connected in indefinite amounts in this manner. The National Electric Code limits the maximum kvar of capacitors that can be connected.—(See ans. No. 1)

A word of caution: There is very little, if any, necessity for ever opening up the capacitor units. There are no moving parts and they are self-fused so they provide their own protection. It must be remembered, however, that capacitors build up a charge and maintain this charge for a period of time after being de-energized.

Therefore, maintenance people wait ten minutes after the capacitor has been de-energized, and then short each terminal to the capacitor case touching the bare studs.

—W.L.T., Ch'go.

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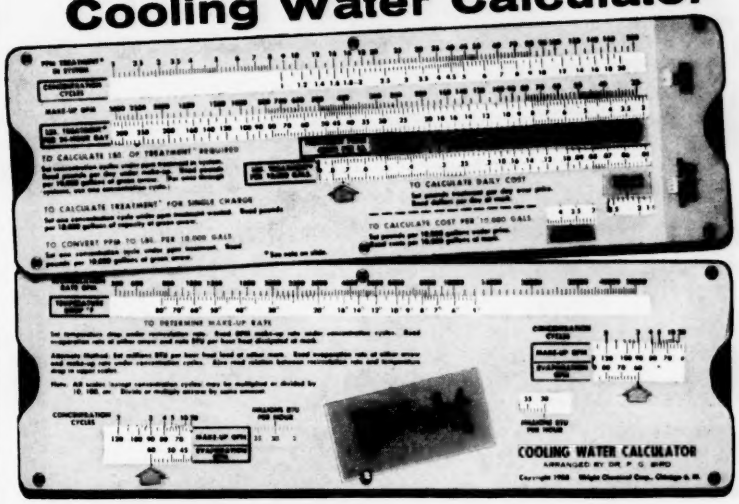

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Bell & Gossett Hosts Engineer Groups

Applies Air Conditioning to Compressor Assembly Area

Joe Raufeisen (second from left) explains the air conditioned compressor assembly line to ASHRAE visitors.

Frank Raufeisen explains the testing facilities for refrigerant compressors in Co.'s research laboratories.

By SCOTT CASSELL

COMPRESSOR manufacturing facility of the Bell & Gossett Co. plant at Morton Grove, Illinois, was the prime attraction for two Chicago engineering groups this past Spring. Chicago Chapter, National Association of Practical Refrigerating Engineers toured the plant on March 24. Chicago Section, ASRE held its final meeting at the same plant on May 14.

Attendance at the last ASRE meeting —the Chicago section now is officially merged with Illinois Chapter ASHAE— attracted 286 members and guests, including a bus-load from Milwaukee.

Special attraction at the May meeting was a special sealed room where compressors are assembled under dust-free, humidity controlled conditions. According to Bell & Gossett officials, the idea is the brain child of Joe Raufeisen, their engineer responsible for refrigeration compressor design and manufacture.

Visitors also inspected the latest air conditioning and refrigeration products manufactured by the company. These included compressors, package liquid coolers, water chillers, pumps, heat exchangers, and electric motors. All manufacturing phases were covered in a field trip including engineering, machining, assembly and testing.

Bell & Gossett were hosts for cocktails and dinner prior to the plant tour. The executives of the company who attended the meeting were R. E. Moore, president, Clarence E. Pullum, executive vice-president; William A. Boone, vice-president and Morry Hofmeister, manager of the air conditioning and refrigeration division.

Technical Meeting For NAPRE

Practical engineers who met at B&G plant in March were given a more technical program on compressors. Joe Raufeisen described the design of the company's new line of reciprocating machines and explained to the engineers the proper maintenance of these units.

Bell & Gossett started in the compressor field as a result of their packaging or assembly of liquid chillers. The NAPRE members were told that it very quickly became evident to them that service and call-backs on water chiller applications were the result of compressor and motor trouble. They resolved this service drawback by getting into the refrigerating compressor industry and by expanding their existing motor division.

In describing the compressor, Engineer Raufeisen related how four basic models, with variation of cylinder arrangement in pairs of 2, 4, 6 and 8, and designed for two different refrigerants (Refrigerant 12 or 22), gave a total selection of 40 units to choose from, with a horsepower range from 7½ to 150. Raufeisen explained that their compressors all have one bore, employ one basic sleeve and valve plate. All compressors use identical two-throw shafts. Bearings are line bored, being pressed in and then machined.

R. E. Moore (at microphone), president, Bell & Gossett Co., welcomes members and guests of Chicago Section, ASRE who attended their last official meeting on May 14 at the B&G plant. Two hundred and eighty six persons attended.

Ring and Valve Variations

Rings also entered into the discussion, the engineer describing for the practical men how the top ring is taper faced for a quick break-in. The second ring is a combination oil wiper and compression ring, and the bottom ring serving as compression baffle only. He described how the rings are designed for 6 to 8 pound tension under compression, and let the operators in on a secret of how to get five years of life out of rings on the 18-hr day operating basis.

After describing the floating wrist pin employed, the instructor for the evening went into the importance of valve lift. He described how the B&G compressors use less than half the lift found in a number of machines, which results in less impact. This design feature, he related, is possibly the reason why the firm has not experienced a single valve plate failure or a ruined seat.

Under questioning by his audience he argued that capacity has not suffered. There is less wire drawing and less valve hunting due to the valve plate's ability to follow the pressure better which is a direct result of valve lightness. Performance tests witnessed later in the evening by the practical engineers showed no loss of capacity, less noise and vibration.

For liquid relief, the compressor has a spring loaded safety head. The spring also holds in the cylinder sleeve. Seals and oil pump on the compressors are by other manufacturers, and the pump has a self-reversing feature. The smaller compressors utilize a double seal back to back, one at the crankcase side and the other on the atmospheric side. Seal improvement eliminated need for hermetic types and avoids the possibility of electrical insulation break-down experienced in a number of hermetic units.

Preventing Oil Pumping

All crankcases of the B&G machines are equipped with heaters. Further, Raufeisen explained there is a check valve, "scientifically designed by accident" which prevents foaming of oil on pump down. The arrangement keeps the crankcase suction 20-lbs above machine suction until the compressor stops. At that time the valve permits the crankcase and the suction to equalize.

Raufeisen also explained the two types of unloading used on B&G machines. One method is by cylinder increments, using the standard method of lifting the suction valve plate by pins or rods actuated by hot gas pressure. The two-cylinder machine, however, is unloaded in a unique manner. A hydraulic unloading device is employed which, by covering machined holes in the sleeve, unloads a portion of all cylinders simultaneously. A three-cylinder machine is under development, it was mentioned by the instructor.

Following this instruction in the *Little Red School House,* NAPRE members were treated to a tour of the plant's manufacturing facilities, followed by refreshments.

Louis Denton Passes

SAN FRANCISCO—California Chapter No. 1, NAPRE, lost one of its most esteemed past presidents in the death of Louis Irwin Denton, in June. Retired since 1947, Denton had nevertheless continued to be active in the chapter until the past couple of years, and was a perennial attender of the NAPRE national meetings.

Denton had been a member of NAPRE for over 36 years, joining at San Francisco early in 1923 as an associate which grade he soon advanced to active.

A graduate of the University of California, 1907, he was mechanical engineer of Pacific Fruit Express Company from 1919 to 1947. Between graduation and PFE employment he had held engineering posts in Wilmington, Delaware and Montreal, Canada.

Surviving Denton are his wife, a daughter, Mrs. R. F. (Loriel) McKee, a son, Stuart Randall, two sisters and two brothers. He was also a member of the First Christian Church of Oakland, the Commonwealth Club, Engineers Club of San Francisco, and ASRE.

—LeRoy Etzel

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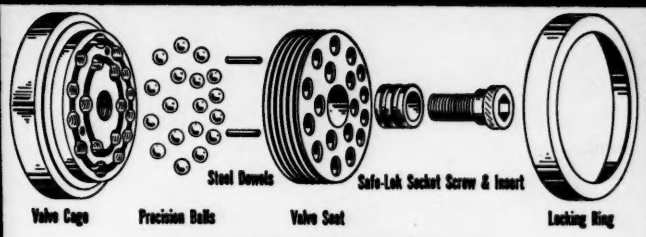

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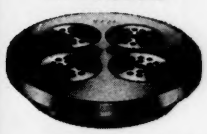

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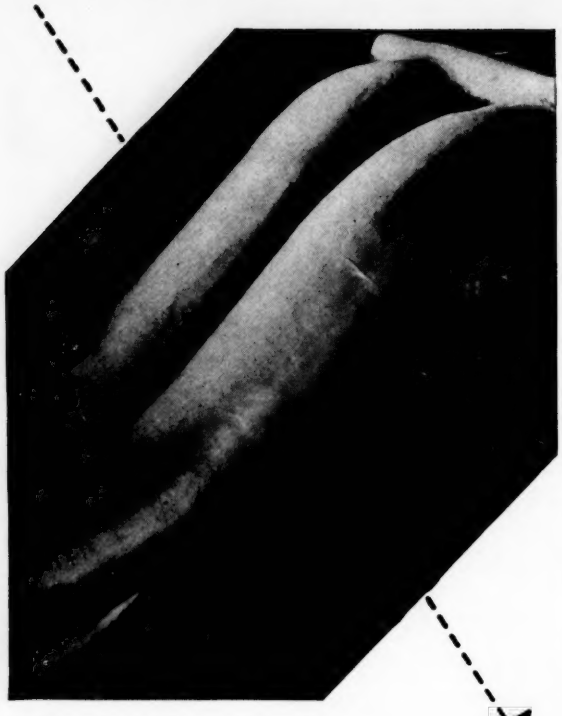

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EUROPEAN REFRIGERATION RESEARCH AND ITS PRACTICAL APPLICATIONS—$3.50

The European Productivity Agency, Organization For European Economic Cooperation

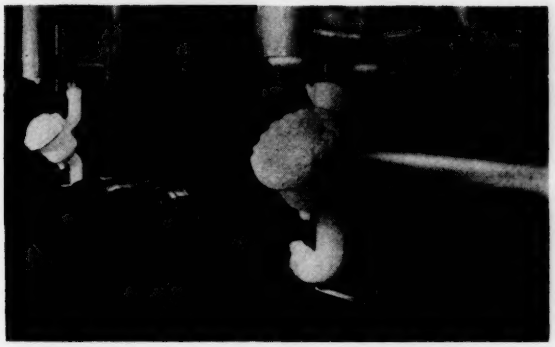
▶▶▶PUBLISHED IN MARCH is a very informative and attractive paper bound booklet entitled EUROPEAN REFRIGERATION RESEARCH, AND ITS PRACTICAL APPLICATIONS. Produced by the Organization For European Economic Co-operation, this review is in the nature of a report by the European Productivity Agency on refrigeration laboratory work in Europe and their industrial uses of refrigeration. This EPA Mission (No. 239) was proposed by the OEEC Machinery Committee after it visited the United States in 1950 to study refrigeration techniques.

Printed in English, the report is in two parts. Part I describes the general organization of research in various member countries and practical applications. Part II contains the various reports which describe the position of refrigeration in each of the countries which participated. Twenty experts from 12 European member countries took part in the Mission, as well as the Director of the International Institute of Refrigeration.

The publication is illustrated to some extent, samples of which accompany this review. The 12 countries on which reports have been submitted in Part II are: Austria, Belgium, Denmark, France, Germany, Greece, Italy, Netherlands, Norway, Sweden, Switzerland, Un. Kingdom.

Caves in the U.S. are not unique for storage. This is a view of a freezing room cut out of rock in Norway.

On European Applications



Close-up of rotary boosters used in connection with a 100-ton per day freezer capacity at Halsingsborgs Fryshus.

Applied Research For Industry

The EPA Mission seemed to think it unique or a little unusual that refrigeration applications outside the food and agriculture sector were researched primarily by the user. Users of refrigeration in medicine, chemistry, and metallurgy, even in air conditioning, were very large concerns or government bodies. The application of refrigeration in these sectors then, except for possibly medicine, is more in the nature of applied rather than basic research.

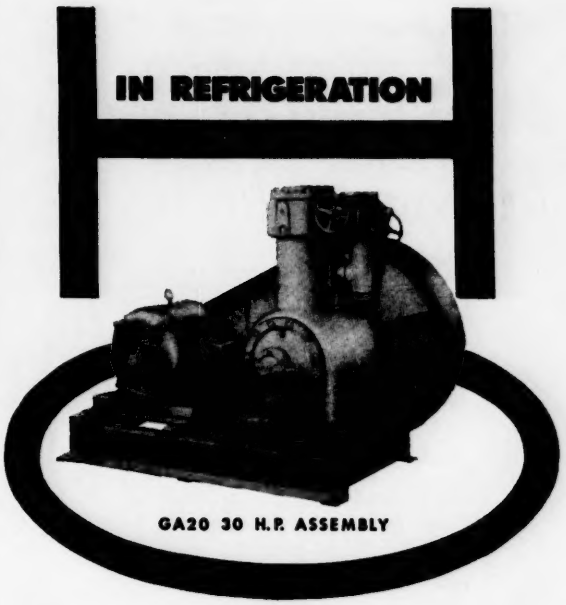
Refrigeration applications in medicine and surgery were varied and came into general use only since the last war. Air conditioning for personal comfort which is a relatively new adaptation in Europe, according to the report, is now making very rapid strides. In the chemical industry, however, refrigeration was used far more widely and has become more matter-of-fact.

Low temperature reseach and metallurgy applications are reported as being rather vast and highly specialized. The report credits the Phillips Laboratory for practical development of machines for the liquifaction and redistillation of hydrogen, oxygen, nitrogen, and the rare gases. Many portions of the book deal with machinery, temperatures and persons employed for industrial refrigeration applications.

List Educational Aids, Institutions

In the Annexes (addenda) are listed the members of the Mission, lists of visits, inventory of European laboratories, list of universities and other institutions providing courses on refrigeraton and its application, and a tabulation of publications and films on refrigeration.

Swiss refrigeration installation for investigating losses associated with corona on high temperature power lines.



THERE IS A *BIG* DIFFERENCE in refrigeration equipment . . . not so much in the actual materials, although they are very important, but in the in-built intangibles such as the builder's integrity, the engineering experience, the degree of specialization and the manufacturer's reputation.

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European Refrig'n (Cont'd)

Each nation's report is patterned after the following general outline: state of refrigeration research and uses; researchers progress, including their careers and recruitment; co-operation at national level between research laboratories and the industry; publication of results; influence of research on design; influence of research on food and agricultural applications; research influence on other applications such as medicine, chemicals, metallurgy, air conditioning, etc.; international cooperation and the role of the IIR; and, recommendations by and for the specific countries reporting.

Practical applications of refrigeration to food and agriculture in the OEEC report, indicate that latest techniques are being used in Europe, thus implying that the results of research are being put into practice. European refrigeration plants, the report states, are comparable in scale and efficiency to any found elsewhere. However, reporters are careful to point out that this statement is by no means intended to denote complacency on the part of European refrigeration users.

Improvement Needed In Meat Chilling

Most slaughter houses have a facility for cooling meat and keeping it fresh for short periods, the report states, but in many cases the carcass takes too long to cool and too much water is lost from the surface tissue. Most enthusiastic welcome of refrigerated research has been in the fish industry where applications have resulted in more efficient icing, quicker turn-round for trawlers and on-board facilities for freezing freshly caught fish. Much improved, is the handling of fruit and vegetables. Probably closest liason between research and industry is in dairy products.

Quick frozen applications of refrigeration involve the most constant research. Many of the countries are equipped with up-to-date freezing plants of all types (batch or continuous), and there is an increasing demand for pre-cooked frozen dishes as well as frozen foods, from housewives, chain stores and airlines. However, the insulated rail transport, the report announced, is old and of doubtful efficiency. Some countries have experimental and testing stations, among them Italy and France. Refrigerated transport by sea has a much higher standard.

Rare Issues Donated By York To Recold Refrigeration Museum

▶▶DONATED BY YORK DIVISION, Borg-Warner Corp., York, Penna., are a number of volumes of COLD STORAGE, a monthly trade publication published from 1899 to 1930. At two volumes per year, the donation to the Recold Museum of Refrigeration and Air Conditioning. numbers over 60 bound editions.

Collection is a unique contribution, said H. T. Hy Jarvis, founder of the museum and president of Recold Corp., Los Angeles, because it is a historic record of the refrigerated warehousing industry in the United States, and the tremendous progress recorded by them for the first half of the last 60 years.

In a 1900 issue there is an item relating how the United States had been called upon to furnish a great part of the equipment which the Russian Government needed to complete the railway line across Siberia to the Pacific Ocean. The article was reporting a $7 million dollar contract for the Western terminal, which included refrigeration facilities.

Industry Meetings

Reefer Truck-Trailers — **Jul. 12-15**
TRUCK-TRAILER MANUFACTURERS ASSN. INC.
The Homestead, Hot Springs, Va.

Food Distribution — **Aug. 10-13**
NATIONAL FOOD DISTRIBUTORS ASSOCIATION
Sherman Hotel, Chicago

International Refrigeration — **Aug. 19-26**
TENTH INTERNATIONAL CONGRESS OF REFRIGERATION
Copenhagen, Denmark

Cryogenics — **Sep. 2-4**
CRYOGENIC ENGINEERING CONFERENCE
University of California, Berkeley

Brewers Exposition — **Sep. 20-25**
MASTER BREWERS ASSOCIATION OF AMERICA
INTERNATIONAL BREWING INDUSTRIES EXPOSITION
Public Auditorium, Cleveland

Instrumentation — **Sep. 21-25**
INSTRUMENT SOCIETY OF AMERICA
International Amphitheatre, Chicago

Meat Packing — **Sep. 25-29**
AMERICAN MEAT INSTITUTE
Palmer House, Chicago

Dairy Conventions — **Oct. 4-10**
DAIRY INDUSTRY SUPPLY ASSN.—Oct. 4-10
Saxony Hotel, Miami Beach
MILK INDUSTRY FOUNDATIONS—Oct. 5-7
Fontainebleau Hotel, Miami Beach
NATIONAL ASSN. OF ICE CREAM MFRS.—Oct. 7-9
Eden Roc Hotel, Miami Beach

Ice Manufacturing — **Oct. 20-24**
NATIONAL ICE ASSOCIATION
Sheraton-Dallas Hotel

Service Engineers — **Oct. 30-31, Nov. 1-2**
REFRIGERATION SERVICE ENGINEERS SOCIETY
Ambassador Hotel, Atlantic City, N. J.

Air-Cond'g & Refrig'n Exposition — **Nov. 2-5**
11TH EXPOSITION OF THE AIR-CONDITIONING AND REFRIGERATION INDUSTRY
Convention Hall, Atlantic City, N. J.

Ice Engineers — **Nov. 11-12**
SWIMA ANNUAL CONFERENCE OF ENGINEERS
Rice Hotel, Houston

Practical Refrigerating Engineers — **Dec. 9-11**
NATIONAL ASSOCIATION OF PRACTICAL REFRIGERATING ENGINEERS
Roosevelt Hotel, New Orleans

Flooded ammonia installation engineered by Theis Refrigeration blast freezes 25,000 lbs. of chicken daily at -30° F.

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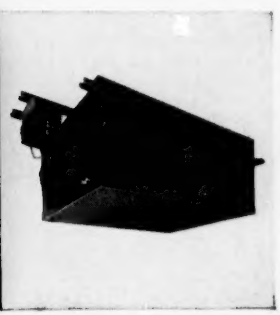

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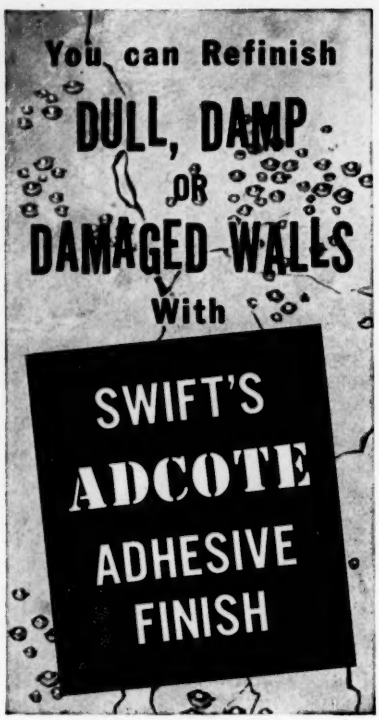

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JUST CLIP TO LETTERHEAD AND MAIL

PERSONS IN THE NEWS—

W. Kohlenberger

C. R. Kohlenberger

Ben Peak

Hans H. Kohlenberger Dies Board of Directors Named

PASSING of **Hans H. Kohlenberger,** 62, founder and president of Kohlenberger Engineering Corp., was reported recently. Death came after a short illness of cancer. The Kohlenberger firm, manufacturers of industrial refrigeration equipment, is located in Fullerton, California.

Death of Hans Kohlenberger has resulted in the election in June of **Walter Kohlenberger** as board chairman, and **Charles R. Kohlenberger** as president. The new board chairman was formerly vice-president and assistant general manager. The new president had held the post of vice-president of engineering. Also named to the board was plant superintendent **Ben Peak.** Other board members include **C. G. Barnard,** secretary-treasurer, **W. G. Stedman, Harold Muckenthaler, C. N. Miles,** directors.

Germany to California

Born in Germany, Hans Kohlenberger came to Anaheim, California, with his parents in 1907. Serving an apprenticeship, he later became chief engineer and then manager of an ice plant in Fullerton, California. Later he did refrigeration consulting and engineering, and in 1922 he founded the industrial refrigeration and air conditioning company which now bears his name.

Active in civic affairs Mr. Kohlenberger served as mayor of Fullerton from 1938 to 1946, and as a member of the city council. He had been a board member to the Metropolitan Water District from its inception. A Mason since 1936, he was a member of Al Malaikah Temple. He was a member of NAPRE.

PEAK joined Kohlenberger after serving for five years as plant superintendent at Sterling Electric Motors, Inc., Los Angeles, where he was originally employed in 1948 as a tool and die maker. At one time operator of his own machine shop, Peak has been associated with tooling and fabrication for 22 years.

American-Standard Changes

AIR CONDITIONING Products Marketing Manager for American-Standard, Industrial Division, is **R. A. Loebl.** Announcement came from **John W. Brennan,** president. **H. C. Grubb** was appointed product manager for centrifugal refrigeration compressors.

Mort Bell Is Now Managing Associated Refrigerating

ANNOUNCED late in May, was the appointment of **Mortimer E. Bell,** as general manager of the Associated Refrigerating Engineers, Los Angeles, California. The announcement came from **Frank J. Hibbs, Sr.,** president. Officers and directors of the firm remained the same according to **Ted J. Peukert,** Secretary-treasurer.

Bell is well known in engineer circles on the Pacific Coast and nationally, having held responsible engineering and executive positions with large firms for the past 30 years. He has been national director, chairman of the board, and is at present 2nd vice-president of NAPRE. He was actively connected with apprentice and other engineering training programs for many years.

Baltimore Aircoil Company Acquires More Representation

SECOND QUARTER of the year has seen many representative additions by Baltimore Aircoil Company, Inc., and the appointment of additional personnel by the sales office of the firm. Announced most recently was the appointment of **Hugh B. Shepard** as Maryland representative. Previously Shepard served as assistant sales manager on a headquarters sales staff at Baltimore.

Paller Engineering Joins

Another June announcement from BAC was the appointment of Paller Engineering Co., Indianapolis to handle BAC condensers and towers. Headed by **Ben Paller,** the Paller Engineering firm will also represent BAC in Northern Indiana, as well as the central part of the state through its branch office in Fort Wayne.

Three more regional appointments came from BAC early in the quarter. They were the appointments of **Roger G. Anderson,** F. W. Jenike Co., Cincinnati, to handle the evaporative condenser cooling line in southwest Ohio and nearby Kentucky and Indiana areas. **Samual Paschal** is in charge of the J. P. Ashcraft Co. Inc., Oklahoma City and are now representing the BAC in the state of Oklahoma. **H. George Richardson,** Richardson Equipment Company, Boise, Idaho, will represent this manufacturer in central and southern Idaho.

Businessmen, Engineers, Manufacturers

R. A. Loebl

H. D. Smart

H. B. Shepard

B. M. McDougal

W. P. Tennity

▶ Ben M. McDougall has been named field sales manager, BAC, according to the announcement by **William E. Kahlert,** Sales Vice-president. McDougall will work closely with the BAC Sales Offices throughout the United States. He was formerly general sales manager of Kennard Corp., St. Louis.

L. A. Appointments Announced

▶ Previously, Baltimore Aircoil announced the appointment of **William P. Tennity,** Tennity & Company, Inc., Los Angeles, as their representative in both southern California and southern Nevada. The same area was represented for a number of years by the recently dissolved Holland-Nurse Co., Los Angeles. **David A. Nurse** and **Kenneth Watts,** both of the former company, are now associated with Tennity. The firm has offices in Redlands and San Diego, as well as Los Angeles.

Recold Corp. Announces Changes And Additions

▶▶ REPRESENTATIVE for Recold Corp. in the Chicago trading area, **Hugh D. Smart,** has relocated a branch office to Oak Park, Ill. The announcement from Recold Corp. headquarters at Los Angeles indicated the new office location provides better customer service facilities than previously afforded.

▶ Recold has appointed the Pearsall Co., **Duane D. Pearsall,** president, as representative for air conditioning products in Colorado and southern Wyoming, it was announced by **Walter L. Hilton,** Western States Sales Manager for Recold. The Pearsall Co. is located in Denver.

New Wholesalers

▶ Hilton also announced the appointment of International, Inc. in San Antonio and Corpus Christi, Texas, as the wholesaler distributor for Recold refrigeration and air conditioning products. Officers of International, Inc. are **Robert C. Trevino,** president, **Theodore P. Christman,** executive vice-president, **Robert E. Reese,** vice-president and sales manager, and **Albert Lew,** treasurer, all in San Antonio. The Corpus Christi branch is headed by **Thomas J. Stewart,** secretary of International. Assisting at the Gulf City are **Rudy Trevino** and **Roy Benavides.**

▶ Much earlier, Recold announced the appointment of California Refrigerator Co. as their wholesale distributor for northern California. The firm has offices in Oakland and San Francisco. Announced at the same time was the appointment of Refrigerating & Power Specialties Co. as the wholesale distributor for refrigeration products for northern California, Oregon, and Washington marketing areas. With home offices at San Francisco, RAPSCO also has offices at Oakland and Spokane, Wash. Their branch in Oregon is Portland and two branches in Washington, at Seattle and Tacoma. **A. F. Tudury** is president of RAPSCO.

Book Subject

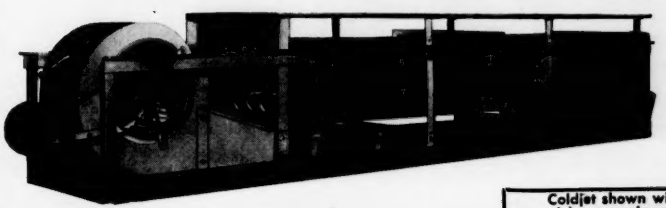
▶ Canterbury Enterprises, publishers of the American Success Series books, released in March, THE RECOLD STORY. Particular tribute is paid in the book to the founder and president of Recold, **H. T. (Hy) Jarvis,** who established the company in the depression year of 1932. Simultaneous with the book introduction the firm was receiving publicity because of an employee profit-sharing and retirement plan. The agreement between Recold and its employees provides for a two to six percent deduction of yearly income on the part of employees toward retirement. Recold contributes up to 15 percent of the annual gross profit.

Iceland Products Moves

Iceland Products, Inc., announced the new location of its office, effective June 15, on Frederick Street in Steelton, Pennsylvania.

More▶

COLDJET *Low Air Velocity*
SPACE COOLERS



Coldjet shown with side panels removed. Cutaway shows 1" sealed-in cork insulation.

- Ceiling-suspended, saves space. (Fits between meat rails!)
- Gentle, quiet air movement eliminates drafts, adds to worker comfort.
- Cuts shrinkage of meat and other food products to a minimum.
- New design cuts installation and maintenance costs.

Imeco Incorporated
Write for Bulletin 958
Phone: JUniper 8-7117
3033 W. Belmont Ave., Chicago 18, Ill.

MORE PERSONS IN THE NEWS—

A. B. Newton

York Advertising Changes

▶▶CONTINUING departmental expansion programs, York Div. of Borg Warner Corp. recently announced four promotions within the company's advertising department. **Todd L. Owens,** manager of advertising and sales promotion, announced that **Kenneth J. Thompson** and **Henry H. Kirkpatrick, Jr.,** have been made sales promotion managers. Thompson is now responsible for the packaged product line sales development, materials and programs. Kirkpatrick has a similar responsibility which includes large central air conditioning equipment and industrial refrigeration machinery.

▶J. Donald Smith, formerly manager of advertising and sales promotion, engineered machinery division, is now advertising manager. The new assignment embraces the supervision of all national advertising activities. **Caron N. Ehehalt** is new manager, advertising promotion.

Engineering Promotions

▶**Alwin B. Newton,** director of engineering, has been named a vice-president of York Div. **Henry M. Haase,** York President, made the announcement earlier, stating that Newton's recognition was the result of his many contributions to the engineering and research program of the firm. Newton holds nearly 200 patents in the field, he is a member of ASME, ASHRAE, NSPE and active in such trade associations as ARI.

▶Among the various works, there have been advancements in personnel at York also. **Richard J. Halloran** has been named general manager at Decatur, Illinois. This announcement was made by **E. F. Peslar,** vice-president and director of operations for the York Div. Halloran had been with York since 1947 serving as assistant to President Henry M. Haase since 1957.

Career Inducements

▶Coincident with national graduation preparations, the York Div. released an attractive booklet to engineering school graduates entitled "A Pathway to Professional Development and a Life-Time Career". The booklet opens with a message from Henry M. Haase which is headed by the question "What Will Commencement Mean To You?" A page is devoted to the status of the refrigeration and air conditioning industry. Then it goes on to show where York products are manufactured and the careers offered by this Division.

To enable the graduate to determine where he might best fit, the booklet continues with full page breakdowns of careers in the marketing, engineering, installation, service, manufacturing and international divisions. Several pages are devoted to the company's training program. The booklet was prepared and distributed by the Training and Education Department.

Sherrod of Carolina Dies

▶▶PAST PRESIDENT of the North Carolina Ice Association and the Southern Ice Exchange, as well as a former director of the National Ice Association, **George S. Sherrod,** 48, died in mid-June. He was president of the Greensboro Ice & Coal Co. Although in declining health for several months, he was hospitalized for only a month.

Sherrod was the Town Commissioner at Long Beach, Carolina and a sponsor of the Friends of the Library Building Fund and the American Cancer Fund. He donated his eyes to the North Carolina Eye Bank for Sight Restoration, one of his final philanthropies. He is survived by his wife, the former Margaret Sellers, a daughter and a son.

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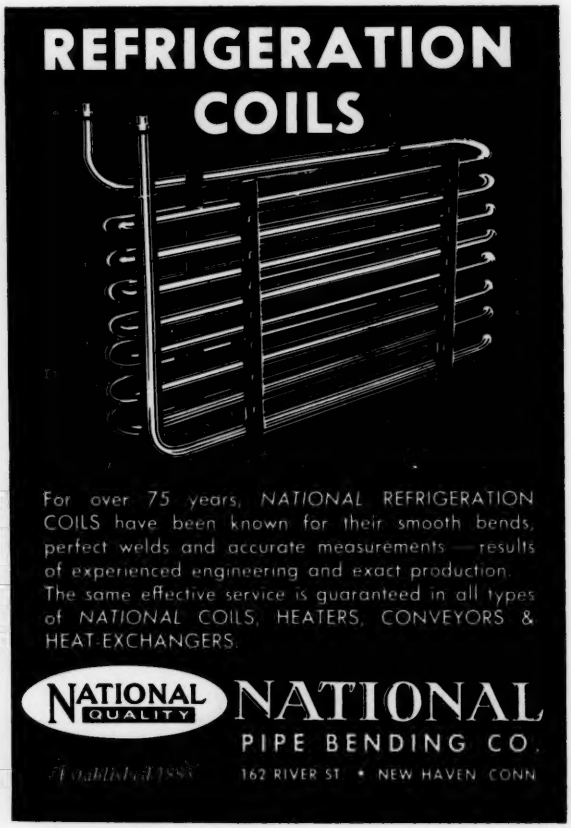
HENRY VALVE CO.
AMMONIA VALVES AND ACCESSORIES
Now available in a complete size range—flanged globe and angle valves with forged steel flanges in F. P. T., socket-weld and welding neck types. Other Henry products include globe and angle shut-off valves; ASME approved relief valves; dual relief valve assemblies; forged steel flanges, unions and fittings.
Catalog 202
Catalog 73
Write for Current Literature and Price Sheets:
Cat. No. 202—Ammonia Valves and Accessories
Cat. No. 73—Drop Forged Carbon Steel Fittings, Unions and Flanged Unions
HENRY VALVE COMPANY
3215 North Avenue, Melrose Park, Illinois (Chicago Suburb)
Cable: HEVALCO, Melrose Park, Illinois
VALVES AND ACCESSORIES FOR REFRIGERATION AND INDUSTRIAL APPLICATIONS


REFRIGERATION COILS
For over 75 years, NATIONAL REFRIGERATION COILS have been known for their smooth bends, perfect welds and accurate measurements — results of experienced engineering and exact production. The same effective service is guaranteed in all types of NATIONAL COILS, HEATERS, CONVEYORS & HEAT-EXCHANGERS.
NATIONAL QUALITY
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PIPE BENDING CO.
Established 1885
162 RIVER ST • NEW HAVEN CONN

Businessmen, Engineers, Manufacturers

Noland Heads Dairy Mfgrs.

ELECTED PRESIDENT of the National Assn. of Dairy Equipment Manufacturers, was **Luke M. Noland** of Mojonnier Bros. Co., Chicago. Election was by the Board of Directors at the close of the 13th Annual Meeting held late in May at Rye, New York.

Noland succeeds **Gordon A. Houran,** manager of the Milk Plant Sales Division, DeLaval Separator Co. **Clark Derleth,** Kusel Dairy Equipment Co. was elected vice-president. Elected members of the board of directors were **K. S. Hart,** Dairy Equipment Co. Madison, Wis., **D. E. Kastner,** L. C. Thomsen & Sons, Inc., Kenosha. **John Marshall,** Executive Vice-president and **Charles M. Fistere,** General Counsel were again appointed for the ensuing year. Other members of the board of directors are **James Brazee,** Creamery Package Mfg. Co., Chicago, Ill., and **Peter Miller** of the Chester-Jensen Co., Inc., Chester, Pennsylvania.

Minn. Door Representative

APPOINTED district representative in Minneapolis, Minn., early in the second quarter of 1959, is **William M. Ryan,** representing Jamison Cold Storage Door Co. He succeeds **H. O. Johnson,** who retired.

W. M. Ryan

Booth C.S. Appointments At Chicago And St. Louis

APPOINTMENT of J. E. Shaw as manager, St. Louis plant, effective in May, was made by Booth Cold Storage Co., Div. of Booth Fisheries Corp. Shaw has been an employee of the company for many years as superintendent. He succeeds **H. A. Steinmeyer** who retired. Succeeding as superintendent is **A. D. Warner.** Warner previously worked in the St. Louis plant but has been superintendent for the past seven years at the Chicago storage. **Frank Conway** succeeds Warner as superintendent in Chicago. Conway had formerly been associated with the Ashland Cold Storage Co.

Cross Succeeds Hutchinson As ASHRAE Executive

PERSONNEL NEWS developing out of the June ASHRAE meeting was the announcement that Robert C. Cross was appointed executive secretary and Aubry V. Hutchinson becomes Executive Secretary, *Emeritus.* The announcement was made by Arthur J. Hess, new president of the society. Since the merger of its predecessor societies ASHAE and ASRE last January, Hess said the society has felt the need for a single administrative head.

Engineer Background

Cross had been Executive Secretary of ASRE since December 1954. Prior, he was assistant manager, merchandise testing and development, Sears Roebuck & Co. for 10 years. Earlier he had served as a field engineer, Battelle Memorial Institute, assistant field engineer, U. S. Bureau of Mines, and was for 10 years an engineer with the H. B. Smith Co.

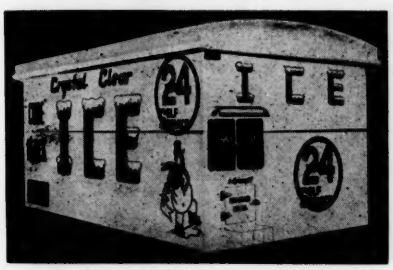
Publications Experience

Hutchinson has been the executive secretary of ASHAE since 1950, having served as secretary for four years prior, and the four years preceeding as manager of publications. He had preceeded his 37-year career with the society, with several trade publications from 1914 to 1921.

K. G. BROWN

Presents

the NEW Multi-Screw VENDOR for 1959



Profit-Making Pacesetter in AUTOMATIC Ice Vending

More Sales + More Storage + Less Cost + Less Servicing

- An increased capacity of 40% over previous models.
- Multi Single Line Vending of any size package or block, regardless of the type of tie.
- These new vendors are now made in lengths up to 20' which will vend 268-10# bags plus 132-25# blocks out of the same delivery door, (400 Sales).
- Up to 5 various sizes of blocks or bags can be vended from this one vendor.
- Radical invention, trouble free, more storage space by design, lower operational cost.

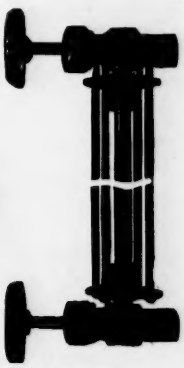
NEW LOW COST 6' x 8' station vends 110-10# packages, or the "Junior", 3' x 7' station vends 90-10# packages using the new multi screw vendor.

ILLUSTRATED 9' x 16' Station vends 168-10# bags and 86-25# block.

BROWN MFG. CO., INC., MATTITUCK, N. Y.

SHANK AMMONIA VALVES

Well Engineered— Precision Built—



ALL-STEEL GAUGE SETS with automatic shut-off of liquid in case of glass breakage.

RELIEF VALVES for Ammonia and Freon. Positive relief action. Pressures from 75 to 300 lbs.

Largest line of Ammonia All-Steel Bar Stock Valves in the industry. Completely Cadmium plated.

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Write for Catalog and Prices.

CYRUS SHANK CO.

4630 West 12th Place, Chicago 50, Illinois

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Coils, Headers and Fabrications . . .

the tougher the job, the better our expert metalworkers like it. With their modern equipment, they produce the finest work to your precise specifications. In any metal, even stainless steel, or up to 6-inch extra heavy. For fast, quality bends, backed up by more than 40 years specialization, call on us!

May we quote on your next job?

CHICAGO NIPPLE

MANUFACTURING CO.
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WORLD'S LARGEST MANUFACTURER
ICE CANS and BASKETS

- GALVANIZED
- WELDED
- RIVETED

Ohio Special Ice Cans are fabricated from finest quality Prime Galvanized Steel Sheets; formed accurate to size and straight for fast harvesting of ice.

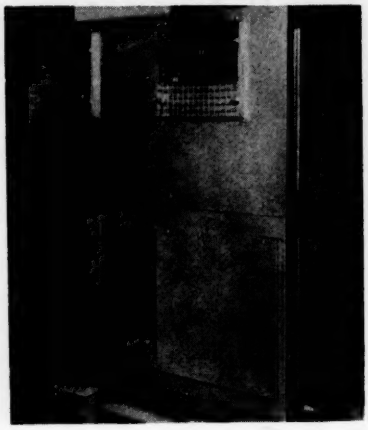
Ice Can Grids or Baskets are designed to lift any number of ice cans and are Hot-Dip Galvanized after fabrication.

Write for Prices

OHIO
GALVANIZING & MFG CO.

ANN ST., NILES, OHIO, U.S.A.

WHAT'S NEW—Continued From Page 7



Air-to-Air Heat Pumps

▶ PACKAGED heat pumps for commercial and small industrial applications have been introduced by an Orlando, Florida firm. These large *Turbo-Flo* cooling-heating coils have now proven themselves in both winter and summer operation according to the manufacturer, on both air-to-air and water-to-air models. They have been on-the-job tested in many parts of the United States, demonstrating a high efficiency.

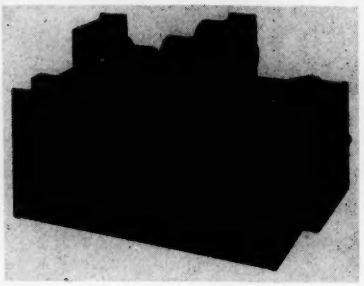
Air-to-air units are constructed in two basic sections. The compressor-condenser section is normally installed out-of-doors, and the fan-coil section indoors. The two sections are completely piped and wired, requiring only two copper tube interconnections.

Aluminum fins are rigidly mounted on the copper tubing in the outdoor sections with extra wide spacing which reduces frequency of frosting during the heating cycle, reduces dirt clogging to a minimum, and provides maximum air flow. In areas where supplemental heat is required, electric resistance heaters can be provided, or an added heat exchanger using a small quantity of water can be in the indoor unit.

Load Limiting Relay For Compressor Motors

▶ PROTECTION for motors of centrifugal refrigeration compressors from overload on start-up, is provided by a new load limiting relay. Designed for pneumatic control systems, the device may be used with all makes of compressors. The manufacturer is a Milwaukee firm specializing in automatic temperature and air conditioning control systems. The relay may also be applied to fans, pumps and electrical heating systems.

Most centrifugal compressors have a tendency to deliver more than rated capacity after overnight or prolonged shutdown, and also under conditions where the cooling load is greater than refrigerating capacity. The new relay is a limit device. It is connected in the control line to the suction damper operator. It limits the output capacity to the full load motor ampere rating.



Compact Air Drier Announced

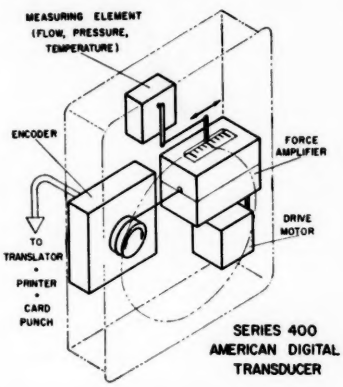
▶ DEVELOPMENT of a compact air drier for continuous dehumidification of laboratories, test rooms and small storage areas has been announced by an Alexandria, Virginia firm. The new machine is the smallest in the firm's line of dual-bed, desiccant type dehumidifiers for industrial installations.

Designed to remove 24 lbs of water per 24 hours, the machine can hold a 10 per cent RH in confined spaces up to 17,500 cu. ft. The unit delivers a constant flow of 50 cfm dry air by alternate utilization of two beds of permanent silica gel. A hair-element humidistat provides automatic control.

Visual Indicators

▶ INSTRUMENTS, gauges, thermometers, and indicators of various types frequently choose peak demand periods in which to be temperamental. Spares are invariably kept on hand by the truly practical engineer. As a reminder, however, to even those operators who have a handy spare, a number of manufacturers have their lines.

Btu Meter Accessory

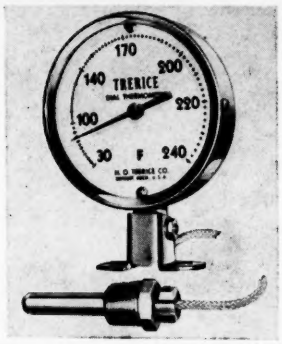


▶ INTRODUCED on page 35, INDUSTRIAL REFRIGERATION, May 1959, was a new btu meter for indicating as well as recording refrigeration or heating furnished by central station air conditioning systems. The manufacturer, a Texas firm, now announces a digital transducer companion element to the meter. The new transducers employ a completely mechanical force amplifier.

More WHAT'S NEW

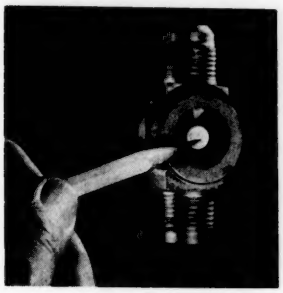
The use of the force amplifier eliminates the need for electronic servos, vacuum tubes, magnetic amplifiers or electronic components, resulting in lower initial and maintenance costs, with an increase in reliability. Operating principle of the force amplifier with complete mounting and maintenance data, is available in literature.

Dial Thermometers



▶LOW COST vapor-actuated dial thermometers in a new line have been announced by a Detroit, Michigan firm. Available in twelve temperature ranges between minus 40 and 450 F, the new dial indicators are offered with a wide choice of mountings. Standard equipment includes a 5-ft. braided armored tube system.

Moisture-Liquid-Indicator



▶A PENNSYLVANIA FIRM has introduced a new moisture-liquid-indicator featuring a fused sight glass. Available in 1/4 through 2-1/8 in. OD, the moisture sensitive element is blue when refrigerant is dry, pink when moisture is present. The liquid indicator is available in all sizes without the moisture indicators where so desired. The fused sight glass feature prevents leakage sometimes experienced with gaskets.

Ultra High Flow Pumps

▶RANKING approximately 4 percent above previous efficiency standards, a new Ultra High Flow (UHF) Pump is offered by a New Jersey manufacturer known for years for its engine and pump equipment. Redesigned from a basic product, the pump offers broader coverage to the customer who can select a custom made pump from a standard group of alternates.

VAN RENSSELAER H. GREENE ASSOCIATES

CONSULTING ENGINEERS

VAN R. H. GREENE — NILS R. BERNZ

REFRIGERATION SPECIALISTS

COLD STORAGE—FOOD PROCESSING—INDUSTRIAL

ENGINEERING SURVEYS, APPRAISALS, COST STUDIES,
COMPLETE ENGINEERING DESIGNS FOR TEMPERATURE AND HUMIDITY CONTROL.

11 PARK PLACE **NEW YORK 7, N.Y.**

Classified Advertising

All classified advertisements are payable in advance. Except for Positions and Help Wanted classifications, this section is reserved exclusively for USED equipment.

RATES: 20c per word; minimum 25 words. $2.00 per line for bold face headings: $15.00 per inch for line listings.

USED EQUIPMENT—wanted & for sale

REFRIGERATION EQUIPMENT FOR SALE
Advise Us Your Needs
Use QUICKSEAL—stops brine tank leaks.
Use CLERTEMPICE—clears and tempers ice.
Born Company 80 East Jackson Boulevard.
Chicago 4, Illinois. WAbash 2-3299.

FOR SALE—Complete equipment of 70 ton ice plant, mostly York, including ammonia compressors, ranging in size from 6"x6" to 11"x13", all with 220 volt motors and controls, except the 11"x13" which is direct connected to 100 h.p. synchronous motor. Also 780 good galvanized ice cans, size 11"x 22"x46"-46½" with LH ½" OD tube and 2" socket. Condensers, air compressors, water brine and ammonia pumps and miscellaneous items. Priced to sell. Starr Brothers, 1129 Broadway, Mt. Vernon, Ill. Phone 202.

AMMONIA EQUIPMENT FOR SALE

2—Vilter 7½"x7½" twin cylinder single acting water cooled vertical ammonia compressors V belted to 2 Wagner Electric 75 h.p. 3 ph., 60 cy., 440V. 1750 r.p.m., 40° rise incl. wiring, switches and guard.
1—Vilter horizontal ammonia liquid receiver 2' dia. x 14' long over all.
1—Vilter special super capacity water cooler 18' 11½" long x 4' 10½" wide x 4' 3¾" high accumulator enclosure—insulated steel chilled water tank, 1 ammonia water cooling coil, 1—6" deep water trough.
1—20" dia. x 6½" long ammonia accumulator.
1—Vilter size 200, type UL evaporative condenser.
2—10 h.p. totally enclosed ball bearing induction motors, 3 ph., 60 cy., 440 V. 1740 r.p.m., 50° rise.
1—Bell & Gossett single stage centrifugal pump.
1—Reliance Electric 2 h.p. induction motor, 3 ph., 60 cy., 440 V. 1740 r.p.m., 50° rise, incl. switches, wiring and controls.
1—Vilter 22" x 20" # 16 gauge steel panel, for wall mount with 1—6" vacuum pressure gauge.
1—6" dia. x 60" welded steel emergency mixer, with supply.
1—4" x 36" welded steel manifold with 3 connections, cork covered.
1—20" x 42" vertical welded steel oil separator.

ALBERT SCHWILL & COMPANY
103rd & Indianapolis Blvd.
Chicago 17, Illinois.

FOR SALE
9x9 York duplex 200 h.p., 360 r.p.m.
9x9 & 10x10 Yorks.
(2) 1½ h.p. Carrier cold air diffusers.
8½ KW motor generator set.
3 h.p. centrifugal low pressure blower.
10 h.p. blower, 15 lb. pressure.
(5) 1/3 h.p. ceiling mounted cold air diffusers.
300 h.p. 4160 volt motor starter.
JOHN F. CARSON
A & Venango Sts. Philadelphia 34, Pa.
GArfield 6-2221

GOEBEL BREWERY—MUSKEGON PLANT

All equipment still erected as last used including York 7½x7½ with Westinghouse 40 h.p. 60/440/3; York 8x8 Model D-6, G.E. 60 h.p. 220/440/60/3, completely overhauled 1956; York 9x9 Model D-6 with G.E. 70 h.p. 60/440/3 completely overhauled 1956; 24"x12" ammonia receiver; 10"x52" oil trap; 2—24"x16" shell and tube ammonia condensers, re-tubed 1956; deep well pump capacity 90 gpm against 75' head; thousands of feet of galvanized ammonia pipe, individual room coolers or defusers, pumps, etc. Write for free listing to Maurice Osterman, Vice President, Charles S. Jacobowitz Corp., 3080 Main St., Buffalo 14, New York.

FOR SALE — AMMONIA EQUIPMENT

3—15 ton complete Frick ice making plants, new in crates, no air system, sold as used.
1—10x10-4-cyl. York duplex DC to 225 h.p. motor.
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1—10"x10"-2 cyl. York DC to 125 h.p. motor.
1—9"x9"-2 cyl. Frick compressor.
1—6½"x6½"-2 cyl. York compressor.
1—3"x3", 1—4"x4", 2—5"x5" condensing units.
3"x3", 4"x4", 5"x5", 6"x6" compressors.
11"x22"x51", 300# ice cans, also 11x22x47.
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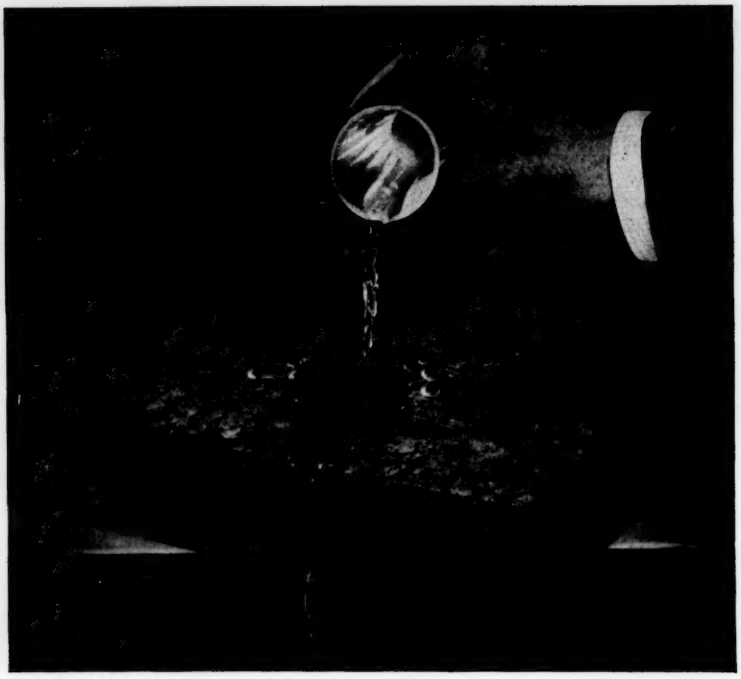

Why United's patented process results in corkboard of lower moisture absorption

Cork in its natural state is well known and highly regarded for its excellent insulating and moisture resistant characteristics. However, by an exclusive blocked-baked patented process that uses internal and external heat to release the natural resins in the cork, United BB Corkboard becomes substantially more moisture resistant.

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Write today for specifications and helpful installation data. No obligation.

UNITED BB CORKBOARD

UNITED CORK COMPANIES

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